

**Phase II**  
**Environmental Site Assessment**  
**(Limited Subsurface Investigation)**

**124/136 Second Avenue**  
**Brooklyn, New York**

**(U.S. Post Office; DMU and VMF Sites)**

**Job No. 97081**

**June 2, 1997**

Phase II Environmental Site Assessment  
(Limited Subsurface Investigation)

124/136 2nd Avenue  
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1.0 INTRODUCTION AND PURPOSE

Nelson, Pope & Voorhis, LLC (NPV) has been contracted to prepare a Phase II Environmental Site Assessment report in accordance with the current environmental quality conditions and historical uses of the subject property. The information gathered during the investigation should be sufficient to identify the areal extent, depth of contamination, and degree of contamination in both soil and groundwater. The investigation generates information to support interim and comprehensive remediation decisions. The scope of this was based on data gathered in previous investigations performed by Rizzo Associates, Inc. and Unico Service Corp. and a Phase I Environmental Site Assessment (dated May 15, 1997) and Groundwater Investigation Monitoring Report (dated April 17, 1997) prepared by Nelson, Pope and Voorhis, LLC.

1.1 EXISTING CONDITIONS

The subject property last operated as a facility for the United States Post Office (USPO). The facility consisted primarily of two structures, a Detached Mail Unit building (DMU) and a Vehicle Maintenance Facility (VMF). The two buildings and support structures have accommodated a number of above ground and underground storage tanks.

The DMU has been identified as having four 10,000 gallon # 2 fuel oil USTs in a vault under the loading dock on the north side of the building. The VMF has been identified as having seven underground storage tanks (two gasoline, two diesel and three lubricating oil tanks) used for USPO vehicles. The USTs in the VMF were recently removed and found to have caused the release of gasoline. The release is the subject of a New York State Department of Environmental Conservation petroleum spill investigation. Three above ground heating oil tanks used for on-site heating applications are also located in proximity of the VMF building.

A review of documents associated with New York State Department of Environmental conservation (NYSDEC) spill number 92-14380 identified the removal of seven USTs (4-5000 gal. and 3-1000 gal.) from the subject property during the period of March 29, 1993 to April 13, 1993 by Unico Service Corp. Additionally, the review of the records showed a Subsurface Investigation performed by Unico Environmental, Inc., dated July 10, 1993, in response to NYSDEC spill number 92-14380. Said investigation included the installation of five monitoring wells with split spoon samples acquired from each monitoring well location on the subject property. Data from the investigation identified elevated levels of volatile and semi-volatile organic compounds in monitoring wells MW-2, MW-4 and MW-5.

Accordingly, a response letter from the NYSDEC, dated June 20, 1994, requested further delineation of the extent of groundwater contamination. Said request entailed the installation of six (6) test borings/monitoring wells at location provided on an accompanied map. The soil samples acquired from these locations were to be analyzed in the field for total hydrocarbons with the worst case sample analyzed utilizing EPA Method 8021 and 8270. Further, the groundwater samples taken from the soil/groundwater probes were requested to be analyzed utilizing EPA Method 8021 and 8270.

The Phase I ESA also identified conditions on the subject site that warranted further subsurface analysis on the DMU site. An historical summary of information leading to this conclusion is provided below.

## 1.2 HISTORICAL SUMMARY

A historical review of Sanborn maps that was performed as part of the Phase I Environmental Sites Assessment indicated that portions of the subject property were formerly utilized as a manufactured gas plant. The plant appeared to have been in operation prior to 1886 and again between 1904 and 1938. At one point, the plant occupied the majority of the subject property as well as the parcel southwest (currently Pathmark) of the subject property. In addition, portions of the property were used for asphalt and paint manufacture. Processes common to these industries are described below for historical reference and informational purposes.

### Manufactured Gas

Manufactured gas was produced from raw materials in specially built apparatus. Two principal types of manufactured gas were formerly utilized as fuel. These are coal gas and carbureted water gas. Other methods of producing manufactured gas exist, however, they were not widely used prior to 1920. Conversely, coal gas plants were in wide use throughout the country by 1880, however, by 1900, many of these plants were closed or abandoned with the advent and popularity of electricity. A resurgence of manufactured gas plants occurred after 1900 when gas fired stoves became popular for cooking (replacing coal and wood stoves), though with the discovery of natural gas in 1920 and its economical advantages, the manufactured gas industry again dissipated.

The coal gas process works by heating coal to produce two useful fuels, coke and manufactured gas. The container in which it is heated is called a by product coke oven or a "retort". The retort is a rectangular box about forty feet long by ten to fifteen feet high and twelve to twenty inches wide. The retort is made of fire brick. It is heated to 1800 degrees Fahrenheit through the walls by burning gas under the oven and allowing it to flue along its sides. Retorts were constructed in batteries side by side to form a "battery". The high temperatures in the oven turn the coal into coke. This process is referred to as "carbonizing". Gas is released during this process. The gas is then piped under positive pressure into coolers and scrubbers which cools the gas and removes tar and ammonia. Subsequently, gas is then moved to purifiers where naphthalene, benzene and toluene were separated out. The gas was then metered and stored in a water sealed storage holder.

The carbureted water gas process uses coke/coal, steam and oil. A typical plant consisted of four units. First was the generator, a cylindrical steel vessel lined with fire brick. The generator contained coke or

coal which was heated white hot to provide the heat necessary for generating hydrogen and carbon monoxide rich gases called "blue water-gas". Second was the carburetor into which the blue water-gas passed from the generator. The carburetor was a vessel with channels made from a checkwork of firebricks which first absorbed heat from the generator, then would give it off at the proper time to heat the gases and vapor passing through. The manufacture of gas was accomplished by spraying oil into the carburetor. The oil was cracked by the blue water-gas into lighter oil gas. The third unit was the superheater which combined and stabilized the blue water-gas and oil gas into carbureted water gas. Then the carbureted water gas would pass to the fourth unit, the washbox, which cooled the gas and condensed out the tar. The gas was then conveyed to purifiers where naphthalene, benzene and toluene were separated out. The gas was then metered and stored in a water sealed storage holder. The gas generated from this process is more efficient for heating applications than manufactured gas using the coal gas process.

All of the by-products of both processes were historically considered valuable resources. The coke was used as a solid fuel and material additive in the manufacture of steel, aluminum, concrete, asphalt and paper products. The tar, referred to as "coal tar" contained benzene, toluene, carbolic acid, aniline, creosote and pitch. Benzene was used as a solvent and in making perfumes and gasoline. Toluene was used in making dyes, paints, explosives and antiseptics. Carbolic acid and aniline were used to make dyes. Creosote was used for preserving wood. Lastly, pitch was used in the manufacture of roofing materials, asphalt and paint.

Based on the Sanborn map of 1886, it would appear as though the manufactured gas plant on the property adjacent to the west of the VMF (current Pathmark site) operated as a coal gas plant used for generating light (gas lights). This supposition is supported by the presence of a retort and a coal storage bin. The plant and retort were not in use in 1886 likely due to the availability and efficiency of electric lights.

The new plant was constructed by Brooklyn Union Gas before 1904 and was suspected to have been constructed to meet the demand for manufactured gas as a heat source. It would appear as though the manufactured gas plant on the property operated as a coal gas plant. Again, this supposition is supported by the presence of a retort and a coal storage bin. However, between 1904 and 1925 the plant appears to be converted to have been a carbureted water gas process. The new plant appears to have had a production rate of manufactured gas that was three times higher than that of the previous plant. The primary MGP processing activities appear to have been located on the site immediately west of the VMF site. This is supported by the fact that the VMF site was primarily occupied by gasholders, or product storage as identified on Sanborn maps.

All or most of the by-products generated on-site could have been sold and/or reused by local industries as a means of disposing of waste and/or off-setting the cost of producing manufactured gas. Local industries operating proximate to the subject property during its use as a manufactured gas plant are identified in the following table:

Company Name	Type of Industry
Hobby & Doody's Lumber Yard	Lumber Manufacturer and Distributor
Philips & Fergusons	Manufacturer of Paints, Whittings and Puttys
Unidentified	Masonry Products Yard
Tartan Chemical Co.	Chemical Manufacturers
The Wilson & Ballie Company	Concrete Manufactures
Ernst Zobels	Pitch Product Sales
W. J. Matheson's Chemical Works	Dyed Products Producers

Based on the known by-products and uses, these nearby industries would have had a demand for the waste materials of the coal-gas process.

#### Asphalt Production

Additionally, the subject property was occupied by an asphalt company on the northwest portion of the DMU parcel. The process of manufacturing hot mix asphalt paving products involves the mixture of aggregate and asphaltum. The aggregates typically include sand and gravel. The asphaltum is a petroleum base product that is solid at ambient temperatures. Asphaltum has chemical and physical properties similar to those of coal tar. However, some of the indicator compounds present in coal tar are not present in asphaltum as they would significantly inhibit curing. The contaminants associated with asphaltum are not mobile as they are encapsulated by the mineral structure of the aggregates. The asphalt plant was identified to contain a vehicle maintenance building and several equipment storage sheds. The vehicle maintenance building was identified as having two gasoline USTs. According to the Sanborn Maps there was no record that one of the two USTs was not removed from the subject property.

#### Paint Manufacture

The area of the subject property beneath the northeast corner of the DMU was formerly occupied by a paint manufacturing plant. This land use was confirmed from the review of historic Sanborn maps of the subject property. Paint is a mixture of a liquid and one or more colored powders. The colored powder is called a pigment. The liquid media that suspends the pigment is called a vehicle or binder, and may include oils, varnishes and resins. Paints are typically diluted with organic solvents to thin the paint and prevent it from prematurely curing. The solvents usually include water, turpentine and volatile organic compounds. Typical pigments are divided into two categories, prime and inert. Prime pigments are white lead, red lead and chrome green. Inert pigments are talc, mica and aluminum clays. Paint colors are produced by the mixing of the primary pigments. Other paints produced use specialty pigments that contain metals such as zinc, copper, aluminum, titanium and iron. Prior to 1867 paint manufacturing was limited to the supply of the pigment only. Painters would prepare the paint at a job site. Following 1867, prepared, canned paints were produced in large volumes. Advancements in chemistry generated new pigments and resins during World War I and II that replace linseed oil, turpentine and fish oil. The widespread use of organic solvents such as toluene, xylene, methylene chloride and benzene did not begin until after the 1950's.

## 2.0 SAMPLING AND ANALYSIS PROGRAM (SAP)

The sampling program was designed and supervised by NPV in collaboration with Impact Environmental Consulting, Inc. Laboratory analytical data was analyzed by ICM Laboratories, Inc. The protocol used to direct this investigation was based upon the documents: 1) the New York State Department of Environmental Conservation (NYSDEC), Spill Operations Technology Series (SPOTS), Memo #14; 2) the NYSDEC Technical Administrative Guidance Manual (TAGM) # 4046 Determination of Soil Cleanup Objectives and Cleanup Levels; 3) the NYSDEC Spill Technology and Remediation Series (STARS); 4) the NYSDEC Division of Water Technical and Operation Guidance Series (1.1.1), Ambient Water Quality Standards and Guidance Values; and 5) the NYSDEC Guidance for Petroleum Spill Stipulation Agreement. The following sections detail the site and area characteristics, sampling program, protocol and quality assurance, laboratory analysis and results.

The data from this investigation, along with any previous data, is to serve as an Investigation Report [IR] and to provide a basis of information to aid in designing a Remediation Plan [RP].

### 2.1 GPR SURVEY

A remote sensing ground penetrating radar field survey was performed over portions of the planimetric surface of the property. The ground penetrating radar (GPR) used in this process was a GSSI model SIR-2 with a 400MHz antenna.

The GPR system consisted of a control unit, control cable and a transducer. The GPR control unit transmits a trigger pulse at a normal repetition rate of 50 KHz. The pulse is then sent to the transmitter electronics in the transducer (antenna) via the control cable where the trigger pulses are transformed into bipolar pulses with higher amplitudes. The transformed pulse will vary in shape and frequency according to the transducer used. The GSSI system is capable of transmitting electromagnetic energy into the subsurface of the earth in the frequency range of 16MHz to 2000MHz. In the subsurface, reflections of the pulse occur at boundaries where there is a dielectric contrast (void, steel, soil type). The reflected portion of the signal travels back to the antenna and the control unit and is subsequently shown on the display of the computer's color video monitor for interpolation.

A qualified technician specified a coordinate system on the planimetric surface to locate any subsurface dielectric anomalies on the premises. The operator used knowledge of the subsurface soil composition to calibrate the SIR-2 system to site specific conditions. Factor settings such as range, gain, number of gain points, and scans per unit, are modified to yield the most accurate data to describe the subsurface conditions.

Upon finding a dielectric anomaly a more specific coordinate system was designed over the area to determine its size, shape and orientation. The data collected during the survey was reviewed by

the operator and compared against past experience, technical judgment and prior site knowledge to classify the anomalies.

No subsurface anomalies characteristic of USTs were identified during the scope of this investigation. A large amount of interference was caused due to the presence of steel reinforced concrete slabs.

## 2.2 GEOPROBE SOIL PROBES

Twenty-two (22) probe nodes, identified as SP-1 through SP-22 were installed on the subject property (Figure 1).

Probe nodes SP-1, SP-2, SP-3, and SP-4 were installed immediately adjacent to the side walls of the former UST tank pit (the tank pit housed seven USTs). SP-5 was installed approximately 150 feet northwest of the former location of the USTs. SP-6 was installed approximately 150 feet north northwest of the former location of the USTs.

Representative soil samples were secured from a sampling interval of 4-8 feet below existing grade from the probe node location for the purpose of soil screening and subsequent sample analysis. The sample interval was selected to identify the subsurface soil at the soil/groundwater interface. The samples were acquired to gauge the impact the spill has had upon subsurface soil quality.

Probe nodes SP-7, SP-8, and SP-9 were installed in the paved area on the west side of the VMF. Representative soil samples were secured from a sampling interval of 3-8 feet below existing grade from each probe node location for the purpose of soil screening. The samples were acquired to investigate the extent of a black tar-like substance found in monitoring well MW-5. The black tar-like substance was identified in each sample at the groundwater interface. One sample, representative of the identified substance was containerized for subsequent laboratory analysis.

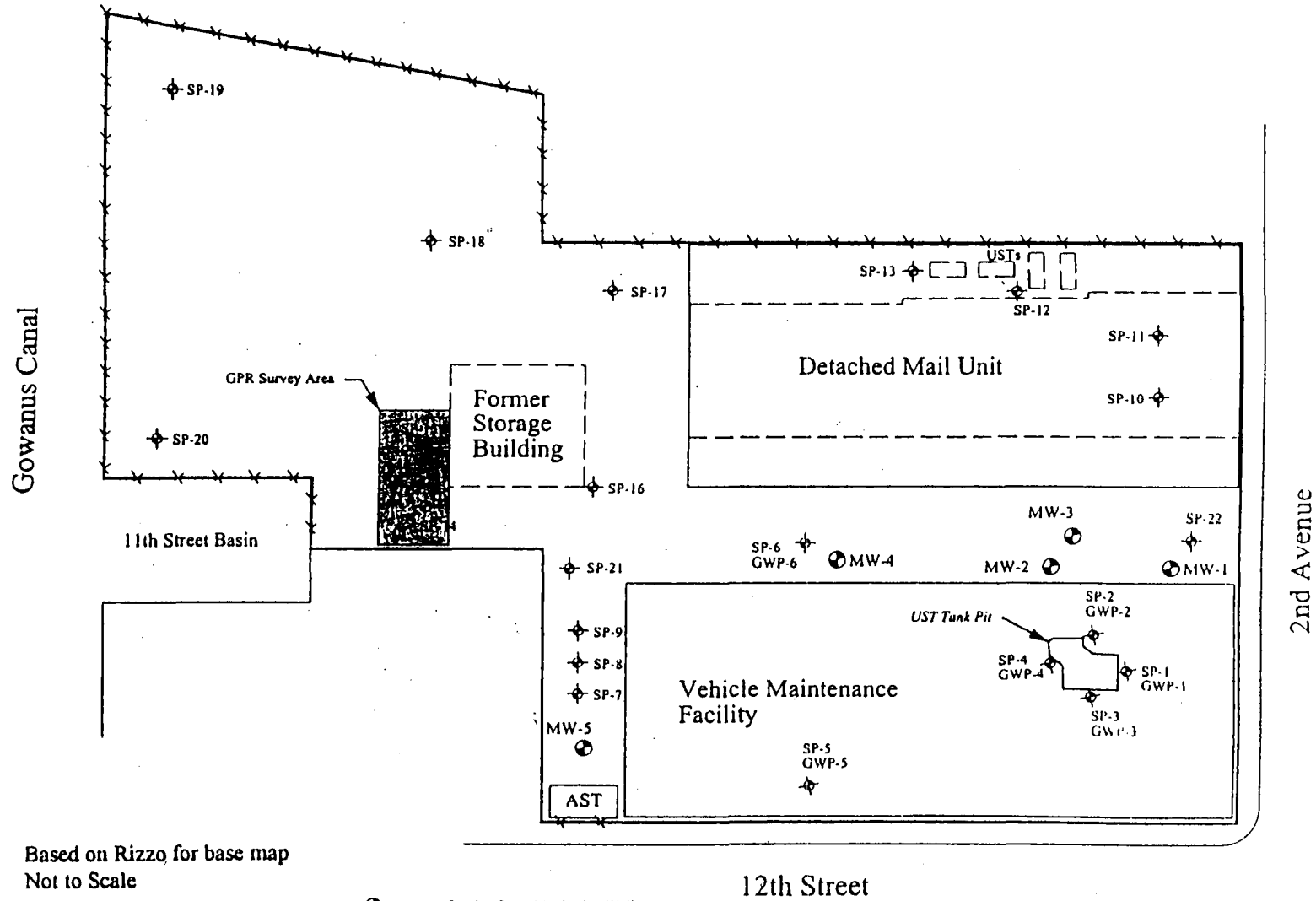
Probe nodes SP-10 and SP-11 were installed within the southeast portion of the DMU (near 2nd Avenue). Representative soil samples were secured from a sampling interval of 4-10 feet below existing grade from each probe node for the purpose of soil screening and subsequent laboratory analysis. The samples were acquired to determine what, if any, impact the pitch paint manufacturer had upon the environmental quality of the subject property.

Probe nodes SP-12 and SP-13 were installed at the loading dock on the northeast side of the DMU. Representative soil samples were secured from a sampling interval of 5-11 feet below existing grade from each probe node location for the purpose of soil screening and subsequent laboratory analysis. A third probe node was attempted in the area, however, due to large amounts of concrete under the slab, a sample was unable to be acquired. The probe node locations were located to determine the environmental quality of the subsurface soil in the area proximal to four 10,000 gallon heating oil USTs.



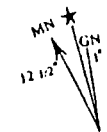
FIGURE 1

SAMPLING PLAN



Source: Based on Rizzo for base map  
Scale: Not to Scale

● Unico Service Corp. Monitoring Well  
⊕ Soil/Groundwater Probe Node



Probe nodes SP-14 and SP-15 were installed in the to the west of the DMU and proximal to the side of the former location of a storage building. Representative soil samples were secured from a sampling interval of 4-8 feet below existing grade from each probe node location for the purpose of soil screening and subsequent laboratory analysis. The probe nodes were installed following a GPR survey to locate the presence and location of any USTs. The GPR survey did not conclusively identify any anomalies characteristic of the presence of a UST, therefore, the node locations were chosen to correspond to the location of the USTs provided in the Sanborn maps. The samples acquired were collected to gauge the environmental quality of the subsurface soil in the vicinity of the former or current location of USTs.

Probe nodes SP-16 through SP-21 were installed at random locations on the northwest portion of the DMU parcel. Representative soil samples were secured from a sampling intervals from one (1) to nine (9) feet below existing grade from each probe node location for the purpose of soil screening. The samples were collected to obtain data regarding this area and the past asphalt manufacturing activities.

Probe nodes SP-22 was installed in the northeast end of the private roadway separating the DMU and VMF. Representative soil samples were secured from a sampling interval of 1-7 feet below existing grade from each probe node location for the purpose of soil screening. Additionally, a soil sample was acquired to gauge the environmental quality of the subsurface soil at the east end of the subject property.

### 2.3 SOIL PROBE INSTALLATION

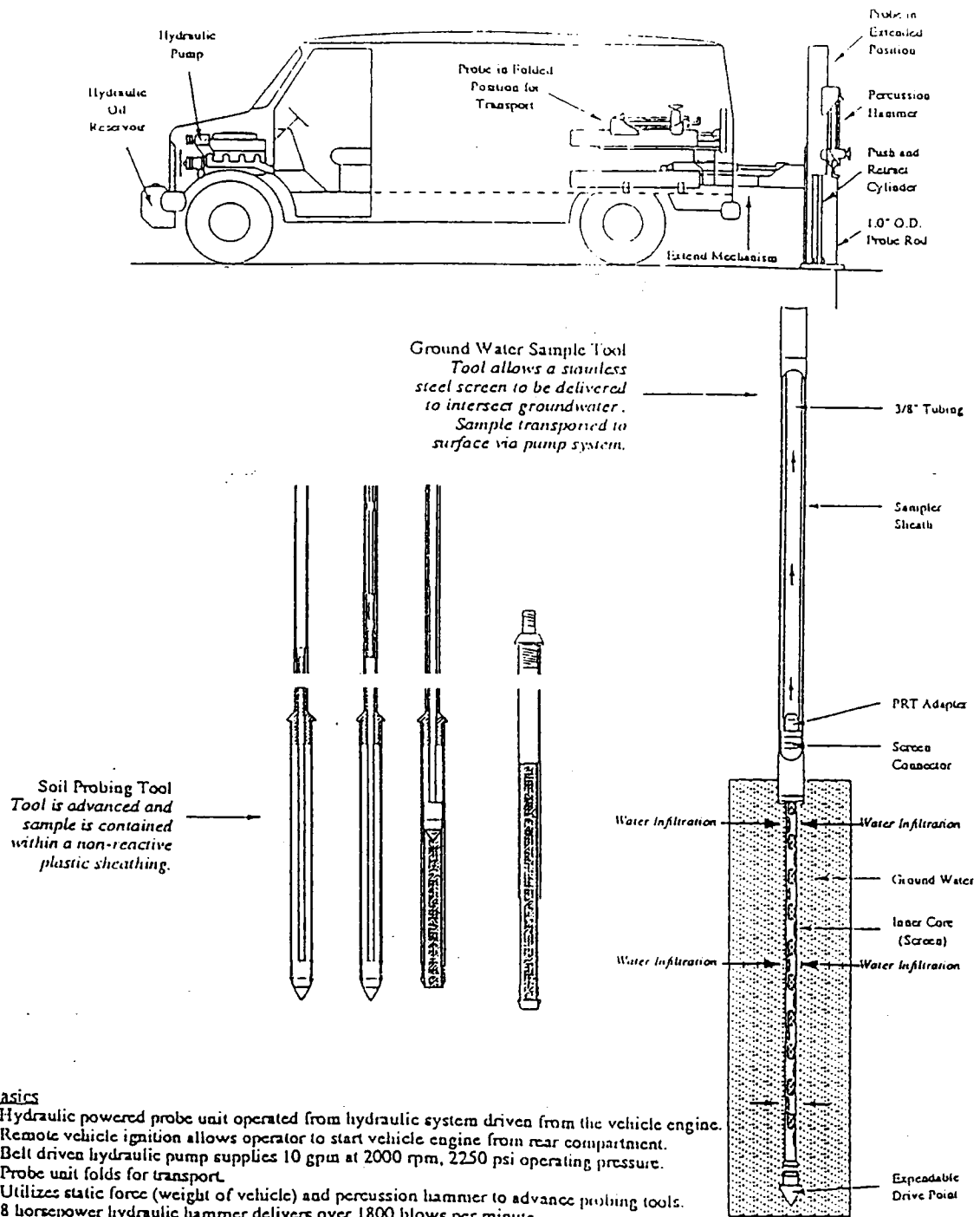
The soil probes were installed using a Geoprobe hydraulically powered soil probing tool (Figure 2). Mechanized, vehicle mounted soil probe systems apply both static force and hydraulically powered percussion hammers for tool placement (static down forces up 3,000 pounds combined with percussion hammers of eight horsepower continuous output). Recovery of large sample volumes was facilitated with a probe-driven sampler. The probe-driven sampler consisted of a hollow probe which was opened via a remote control mechanism at the selected sampling depth in the soil profile to allow soil to enter as it was advanced. Discrete samples were secured at the desired depths and were contained within a non-reactive plastic sleeve which lines the hollow probe for subsequent inspection and analysis.

### 2.4 Head Space Analysis and Procedure

Head space analysis was performed on each of the samples acquired from probe node SP-1 through SP-6 to provide precursory data regarding potential contamination. Results of the analysis were used to adjust the sampling and analysis program to yield the most accurate and representative results as well as to direct the technical field crew in selection of samples for

FIGURE 2

## GEOPROBE SAMPLING APPARATUS



### Basics

- Hydraulic powered probe unit operated from hydraulic system driven from the vehicle engine.
- Remote vehicle ignition allows operator to start vehicle engine from rear compartment.
- Belt driven hydraulic pump supplies 10 gpm at 2000 rpm, 2250 psi operating pressure.
- Probe unit folds for transport.
- Utilizes static force (weight of vehicle) and percussion hammer to advance probing tools.
- 8 horsepower hydraulic hammer delivers over 1800 blows per minute.
- Hammer features 0-300 rpm L/R directional rotary function for drilling surface pavements.
- Probes have greater than 12,000 pounds of pulling capacity.
- Drives small diameter (1.0" O.D.) probing tools to depths of over 80'.



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subsequent confirmation of analytical analysis by the laboratory. The results of the head space analysis are presented in Table 1.

Head space analysis was performed on each of the acquired unsaturated soil samples utilizing a portable photo ionization detection (PID) meter to measure what, if any, hydrocarbon concentrations were present in isolated portions of the secured samples. Head space analysis was conducted by partially filling a non reactive plastic bag with sample aliquot and sealing the top zip lock seal, thereby creating a void. This void is referred to as the sample head space.

To facilitate the detection of any hydrocarbons contained within the head space, the container was agitated for a period of thirty (30) seconds. The probe of the vapor analyzer was then injected through the seal into the head space to measure the hydrocarbon concentrations present. A Photovac Micro-Tip, PID was the organic vapor analyzer selected for the head space analysis. A PID utilizes the principle of hydrogen flame ionization for detection and measurement of hydrocarbon compounds. A PID does not respond to all compounds similarly; rather, each compound has its own response factor relative to its calibration. For this investigation, the PID was calibrated to Isobutylene. Hydrocarbon relative response factors for a PID calibrated to Isobutylene are published by the manufacturer. Head space analysis was performed by a qualified and trained field technician under supervision of NPV.

TABLE 1  
HEAD SPACE RESULTS

Probe Node	SP-1	SP-2	SP-3	SP-4	SP-5	SP-6
Headspace (ppm)	46	125	74	136	64	49

Notes: All results are in parts per million (ppm)  
Shaded cells indicates analytical data available for sample.

## 2.5 LABORATORY SAMPLE LOCATION AND FREQUENCY

Sample identification was consistent with the probe node locations identified in Figure 1.

The samples from SP-1 through SP-6 were labeled for identification purposes as 97-070-SP-1, 97-070-SP-2, 97-070-SP-3, 97-070-SP-4, 97-070-SP-5, and 97-070-SP-6, respectively.

The sample obtained from probe node SP-7 was labeled for identification purposes as 97-070-Product Sample.

The samples acquired from probe nodes SP-10 through SP-15 were labeled for identification purposes as 97-070-SP-10, 97-070-SP-11, 97-070-SP-12, 97-070-SP-13, 97-070-SP-14, and 97-070-SP-15, respectively.

## 2.6 SOIL CHARACTERIZATION

A visual inspection of all soil samples recovered during the installation of each of the probes was conducted to identify any gross signs of chemical contamination and to classify the soils. **Appendix A** contains the Soil Boring Logs for a complete description of the collected samples. Soil gradation classifications were made in accordance with the Unified Soil Classification System. Soil color classifications were made in accordance with the Munsell Classification System.

In general, the natural soils of the subject property were found to consist of a black poorly sorted fine silty sand. Gross indications of contamination were noted in the samples secured from soil probe nodes SP-1 through SP-13. A distinct odor of sewage was noted in the samples secured from probe nodes SP-14 through 21. **Figure 3** provides a potentiometric surface of black substratum.

## 2.7 GEOPROBE GROUNDWATER PROBES

Six (6) probe nodes, identified as GWP-1, GWP-2, GWP-3, GWP-4, GWP-5, and GWP-6 were installed on the subject property (**Figure 1**).

Probe nodes GWP-1, GWP-2, GWP-3, and GWP-4 were installed immediately adjacent to the former location of the USTs. GWP-5 was installed approximately 150 feet northwest of the former location of the USTs. GWP-6 was installed approximately 150 feet north northwest of the former location of the USTs.

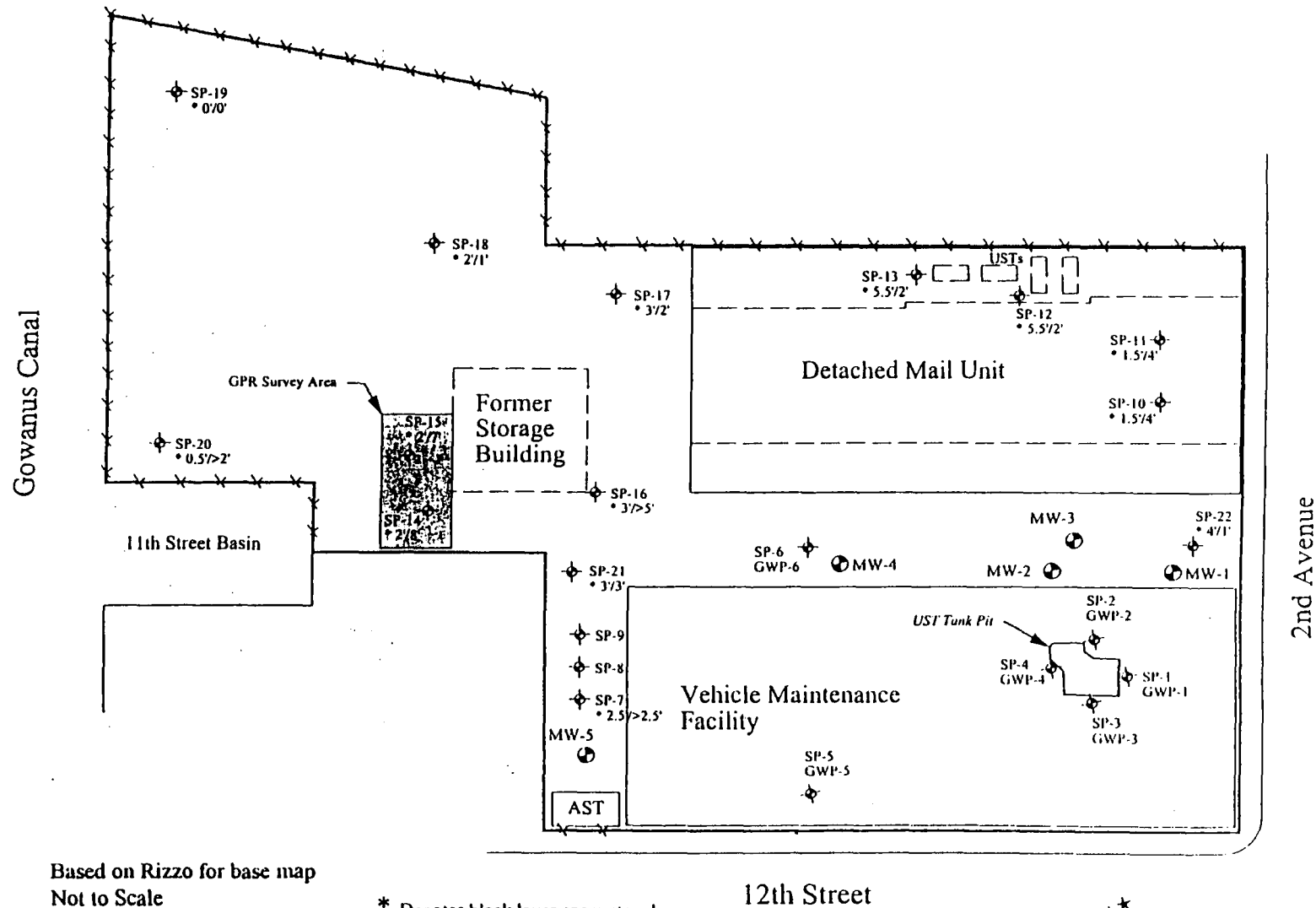
Groundwater samples were secured from each probe node (except GWP-5) location for the purpose of subsequent sample analysis. A groundwater sample was unable to be secured from GWP-5 due to poor groundwater infiltration.

## 2.8 GROUNDWATER PROBE INSTALLATION

The groundwater sampling system used was the Geoprobe Screen Point 15, which is designed to accurately collect grab samples of groundwater. The Screen Point 15 uses a screen with a standard slot size of 0.004 inches that is sealed inside a 1.5-inch ID alloy steel sheath as it is driven to depth. The screen is sealed inside the sheath with Neoprene O-rings which prevent infiltration of formation fluids until the desired depth is attained. When the screen has been driven to the depth of interest in the formation, extension rods are used to hold the screen in position as

FIGURE 3

POTENTIOMETRIC SURFACE OF BLACK SUBSTRATUM



Source: Based on Rizzo for base map  
Scale: Not to Scale

\* Denotes black layer encountered  
(depth below existing grade/thickness)

⊕ Unico Service Corp. Monitoring Well  
⊙ Soil/Groundwater Probe Node



the driving rods are retracted approximately 4 feet. The 4-foot long sampler sheath forms a seal above the screen as it is retracted. A total of 41.5 inches of slotted screen is placed into contact with the formation. The Screen Point 15 groundwater sampler has a total boring diameter of 1.5 inches, the outside diameter of the screen is 1.0 inch. This provides for a maximum of 0.25 inches between the screen and the natural formation as the sampler sheath is retracted. These conditions approach the ideal for natural formation development which can be conducted when lower turbidity samples are required.

Each groundwater sample was collected from the sampler utilizing 3/8 inch in diameter disposable tube equipped with a bottom check valve. The tubing extended from the surface down to the sampler. The tubing was oscillated up and down continuously until the check valve had trapped an adequate volume of a groundwater sample. The tubing was then removed and the water was pored into appropriate sample vessels for subsequent laboratory analysis.

## 2.9 MONITORING WELL SAMPLING

Groundwater monitoring wells MW-1, MW-2, MW-3, MW-4 and MW-5 were developed and sampled in accordance with the United States Environmental Protection Agency (USEPA) protocol by a qualified technician. Approximately three well volumes of water were purged from each of the wells for development. The purged water was stored on site in sealed fifty-five gallon drums and labeled as non-hazardous liquid, purged water. Sampling was immediately performed utilizing a clean Voss disposable bailer for each well to prevent cross-contamination. Samples were preserved in a 40-ml glass vial. Samples were preserved at 4°C in a cooler and transported under proper chain-of-custody procedures to a NYS-DOH certified commercial laboratory for analysis.

MW-1 was identified as an upgradient groundwater source and was located near the southeast property line (2nd Avenue). MW-2 was located in proximity of the former location of the fill and vent lines of the USTs in the VMF. MW-3 was located at a point northeast of MW-2 and was used to gauge the horizontal extent of contamination. MW-4 and MW-5 were located at points down gradient of the USTs in the VMF (refer to Figure 1).

### 3.0 LABORATORY ANALYSIS

#### 3.1 ANALYTICAL TEST METHODS

The soil and groundwater samples were transported to a New York State Certified Commercial Laboratory for analysis. Selection of the analytical test methods for the soil and groundwater samples were based on the New York State Department of Environmental Conservation (NYSDEC) Petroleum Contaminated Soil Guidance Policy (STARS), Section V, Laboratory Methods.

The analysis performed on the soil samples secured from probe nodes SP-1 through SP-6 consisted of USEPA Test Methods 8021 and 8270 for total volatile and semivolatile organic compounds, USEPA Test Method 6010 for metals, and USEPA Test Method 9010 for cyanide.

The analysis performed on the product sample secured from probe node SP-7 consisted of a fingerprint analysis for gasoline and diesel range organics (GRO and DRO).

The analysis performed on the soil samples secured from probe nodes SP-10 and SP-11 consisted of USEPA Test Methods 8240 and 8270 for total volatile and semivolatile organic compounds, USEPA Test Method 6010 for priority pollutant metals, and USEPA Test Method 9010 for cyanide.

The analysis performed on the soil samples secured from probe nodes SP-12 and SP-13 consisted of USEPA Test Methods 8021 and 8270 for total volatile and semivolatile organic compounds.

The analysis performed on the soil samples secured from probe nodes SP-14 and SP-15 consisted of USEPA Test Method 8021 for total volatile organic compounds.

The analysis performed on the groundwater samples secured from probe nodes GWP-1, GWP-2, GWP-3, GWP-4, and GWP-6 consisted of USEPA Test Methods 624 and 625 for total volatile and semivolatile organic compounds and USEPA Series 200 for 13 metals.

The analysis performed on the groundwater samples secured from monitoring wells MW-1, MW-2, MW-3, MW-4, and MW-5 consisted of USEPA Test Methods 624 and 625 for total volatile and semivolatile organic compounds.

#### 3.2 ANALYTICAL RESULTS

Laboratory analysis performed on soil samples 97-070-SP-1 through 97-070-SP-6 and 97-070-SP-10 through 97-070-SP-13 detected several target analytes. The laboratory results from sample 97-070-Product Sample, 97-070-SP12, and 97-070-SP-13 identified reportable quantities



of GROs and DROs. The detected analytes are presented in **Table 2**, Detected Volatile Organic Compounds and **Table 3**, Detected Semi-volatile Organic Compounds. The laboratory analysis sheets prepared by ICM Laboratories, Inc. are presented in **Appendix B** of this document.

Laboratory analysis performed on soil samples 97-070-SP-1 through 97-070-SP-6, 97-070-SP-10 and 97-070-SP-11 detected several inorganic target analytes. The detected analytes are presented in **Table 4**, Detected Inorganic Compounds. The laboratory analysis sheets as prepared by ICM Laboratories, Inc. are presented in **Appendix B** of this document.

The fuel finger print analysis performed on the product sample acquired from probe node SP-7 displayed notable concentrations of GROs and DROs. The hydrocarbon range and peak ratios obtained from the test chromatographs were similar to those of coal tar.

The laboratory analysis performed on the groundwater samples acquired from GWP-1, GWP-2, GWP-3, GWP-4, GWP-6, MW-1, MW-2, MW-3, MW-4 and MW-5 detected several target analytes. The detected analytes are presented in **Table 5**, Detected Organic Compounds in Groundwater. The laboratory analysis sheets prepared by ICM Laboratories, Inc. and NEI/GTEL Environmental Laboratories, Inc. are presented in **Appendix B**.

**TABLE 2**  
**DETECTED VOLATILE ORGANIC COMPOUNDS**

Sample ID	SP-1	SP-2	SP-3	SP-4	SP-5	SP-6	SP-12	SP-13	SP-14	SP-15	STARS Regulatory Level	SP-10	SP-11	NYSDEC TAGM 4046
Unit	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
<b>Volatiles:</b>														
Benzene	ND	68	25	140	ND	ND	ND*	ND*	ND	ND	14	ND	ND	60
Ethylbenzene	7.9	320	100	390	ND	19	2,000*	9,300*	ND	ND	100	ND	ND	5,500
Toluene	52	500	77	320	ND	20	ND*	ND*	ND	ND	100	ND	ND	1,500
Isopropylbenzene	ND	ND	ND	ND	ND	ND	2,400*	2,600*	ND	ND	100	ND	ND	NA
o-Xylene	63	2,300	230	1,500	330	12	4,700*	5,700*	ND	ND	100	ND	ND	1,200
m+p-Xylene	55	2,200	330	1,700	ND	ND	4,800*	6,100*	ND	ND	100	ND	ND	1,200
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND*	ND*	ND	ND	NA	ND	6.7	100
n-Propylbenzene	6.7	380	31	210	ND	ND	2,000*	2,200*	ND	ND	100	ND	ND	NA
p-Isopropyltoluene	ND	270	14	ND	ND	6.6	2,600*	3,500*	ND	ND	100	ND	ND	NA
1,2,4-Trimethylbenzene	140	5,200	440	5,200	3,700	12	18,000*	17,000*	ND	ND	100	ND	ND	NA
1,3,5-Trimethylbenzene	25	2,400	190	1,500	540	48	11,000*	15,000*	ND	ND	100	ND	ND	NA
n-Butylbenzene	17	3,000	140	2,600	1,600	ND	70,000*	78,000*	ND	ND	100	ND	ND	NA
Napthalene	39,000	470,000	200,000	230,000	160,000	2,800	180,000*	270,000*	1.9	ND	200	ND	ND	NA
t-Butyl-benzene	39	3,400	210	2,600	860	ND	7,300*	9,200*	ND	ND	100	ND	ND	NA

\* - Results for SP-12 and SP-13 derived by USEPA Test Method 8240

Bold values represent concentrations above guidance values.

ND = Not present above laboratory detection limits.

TABLE 3

DETECTED SEMI-VOLATILE ORGANIC COMPOUNDS

Sample ID	SP-1	SP-2	SP-3	SP-4	SP-5	SP-6	SP-7	SP-12	SP-13	SP-14	SP-15	STARS Regulatory Level	SP-10	SP-11	NYSDEC TAGM 4046
Unit	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
<b>Semi-Volatiles:</b>															
Acenaphthylene	22,000	<b>61,000</b>	24,000	<b>69,000</b>	3,300	2,200	NA	7,600	12,000	NA	NA	41,000*	270	ND	41,000
Acenaphthene	11,000	<b>55,000</b>	21,000	<b>59,000</b>	10,000	2,400	NA	120,000	170,000	NA	NA	400	2,800	230	90,000
Fluorene	41,000	<b>170,000</b>	<b>68,000</b>	<b>190,000</b>	7,300	5,500	NA	80,000	110,000	NA	NA	1,000	3,800	ND	350,000
Phenanthrene	160,000	<b>770,000</b>	<b>320,000</b>	<b>640,000</b>	18,000	14,000	NA	190,000	290,000	NA	NA	1,000	6,300	2,100	220,000
Napthalene	ND	ND	ND	ND	ND	ND	NA	300,000	450,000	NA	NA	200	1,300	ND	13,000
Anthracene	20,000	<b>72,000</b>	36,000	93,000	5,900	3,400	NA	54,000	82,000	NA	NA	1,000	6,300	510	700,000
Fluoranthene	60,000	<b>200,000</b>	<b>61,000</b>	<b>170,000</b>	9,400	9,500	NA	78,000	150,000	NA	NA	1,000	23,000	3,100	1,900,000
Pyrene	140,000	<b>440,000</b>	<b>200,000</b>	<b>410,000</b>	18,000	16,000	NA	140,000	220,000	NA	NA	1,000	27,000	3,500	665,000
Benzo(a)anthracene	56,000	<b>160,000</b>	<b>67,000</b>	<b>140,000</b>	6,700	4,900	NA	39,000	78,000	NA	NA	220	10,000	1,800	3,000
Chrysene	68,000	<b>200,000</b>	<b>88,000</b>	<b>180,000</b>	6,800	5,600	NA	38,000	80,000	NA	NA	0.04	9,600	1,700	400
Benzo(b)fluoranthene	61,000	<b>170,000</b>	<b>74,000</b>	<b>140,000</b>	4,700	3,100	NA	42,000	97,000	NA	NA	220	16,000	1,800	1,100
Benzo(a)pyrene	42,000	<b>110,000</b>	<b>50,000</b>	<b>110,000</b>	7,300	4,000	NA	31,000	69,000	NA	NA	61	10,000	1,600	11,000
Indeno(1,2,3-cd)pyrene	12,000	<b>33,000</b>	<b>17,000</b>	<b>32,000</b>	2,000	ND	NA	9,200	22,000	NA	NA	0.04	3,900	550	3,200
Dibenz(a,h)anthracene	6,200	<b>17,000</b>	<b>8,900</b>	<b>15,000</b>	ND	ND	NA	ND	ND	NA	NA	1,000	ND	ND	165,000,000
Benzo(g,h,i)perylene	16,000	<b>39,000</b>	<b>19,000</b>	<b>34,000</b>	2,100	ND	NA	ND	ND	NA	NA	0.04	ND	ND	800,000

\* - Derived from TAGM 4046

Bold values represent concentrations above guidance values.

ND = Not present above laboratory detection limits.

\*\* - Results for SP-12 and SP-13 derived by USEPA Test Method 8240

**TABLE 4**  
**DETECTED INORGANIC COMPOUNDS**

Sample ID	SP-1	SP-2	SP-3	SP-4	SP-5	SP-6	SP-10	SP-11	NYSDEC TAGM 4046	Soil Background Range
Unit	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Antimony	1.89	2.42	0.893	1.15	ND	8.72	1.17	1.2	SB	NA
Arsenic	16	18.4	11.2	14.6	8.91	10	8.78	6.63	7.5 or SB	3.0-12.0
Beryllium	ND	ND	ND	ND	0.52	0.323	0.293	ND	0.16 or SB	0.0-1.75
Cadmium	ND	ND	ND	0.192	ND	ND	0.293	ND	1 or SB	0.01-2.0
Chromium	18.9	20.4	13.3	13.9	14.5	15.4	13.1	9.98	10 or SB	1.5-40.0
Copper	98.5	152	117	114	76.7	77.5	52.5	99.2	25 or SB	10.0-80.0
Cyanide	139	157	137	148	ND	15.2	-	-	SB	0
Lead	2,170	2,010	427	1,070	832	404	256	453	SB	10.0-37.0
Mercury	0.53	1.02	0.995	1.12	20.7	0.93	7.05	3.11	0.1	0.001-2.0
Selenium	2.34	2.35	1.47	1.79	1.88	0.968	1.17	1.14	2 or SB	0.1-0.125
Silver	ND	0.458	ND	0.575	ND	1.55	ND	ND	SB	NA
Zinc	168	127	91.8	95.9	159	266	129	204	20 or SB	37.0-60.0

ND = Not present above laboratory detection limits.

SB = Soil Background

TABLE 5

DETECTED VOLATILE ORGANIC COMPOUNDS  
IN GROUNDWATER

Sample ID	GWP-1	GWP-2	GWP-3	GWP-4	GWP-6	MW-1	MW-2	MW-3	MW-4	MW-5	NYSDEC Ambient Groundwater quality standards and limitations
Unit	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
<b>Volatiles:</b>											
Benzene	8.7	150	300	300	ND	ND	ND	ND	480	1,500	0.7
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	390	590	5
Toluene	6.3	ND	ND	ND	ND	ND	ND	ND	ND	300	5
Xylenes	13.7	144	120	110	ND	ND	ND	ND	520	980	10
1,2,4-Trimethylbenzene	8.7	80	170	170	ND	ND	ND	ND	ND	ND	5
Napthalene	270	1200	2000	2600	120	ND	ND	ND	21	4,600	10
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND	11	190	20
Flourene	ND	ND	ND	ND	ND	ND	ND	ND	ND	79	50
<b>Semi-Volatiles:</b>											
Acenaphthylene	78	390	160	420	4	ND	NA	NA	NA	NA	NA
Acenaphthene	24	360	140	310	9.7	ND	NA	NA	NA	NA	20
Fluorene	90	980	470	1,100	10	ND	NA	NA	NA	NA	50
Phenanthrene	290	ND	920	2100	17	ND	ND	ND	ND	76	50
Anthracene	43	430	220	550	3.7	ND	NA	NA	NA	NA	50
Fluoranthene	140	1,100	280	620	10	ND	NA	NA	NA	NA	50
Pyrene	300	ND	560	1,500	12	ND	NA	NA	NA	NA	50
Benzo(a)anthracene	110	640	210	660	4	ND	NA	NA	NA	NA	0.002
Chrysene	150	760	250	640	4.5	ND	NA	NA	NA	NA	0.002
Benzo(b)fluoranthene	120	560	170	510	4.8	ND	NA	NA	NA	NA	0.002
Benzo(a)pyrene	93	410	160	460	3.5	ND	NA	NA	NA	NA	ND
Indeno(1,2,3-cd)pyrene	31	85	29	77	1.6	ND	NA	NA	NA	NA	0.002
Dibenz(a,h)anthracene	ND	44	17	43	ND	ND	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	36	98	40	86	18	ND	NA	NA	NA	NA	NA

Bold values represent concentrations above guidance value.

ND = Not present above laboratory detection limits.

#### 4.0 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES (QA/QC)

Sampling protocol was conducted in accord with USEPA accepted sampling procedures for hazardous waste streams (Municipal Research Laboratory, 1980, Sampling and Sampling Procedures for Hazardous Material Waste Streams, USEPA, Cincinnati, Ohio EPA- 600/280-018) and ASTM Material Sampling Procedures. All samples were collected by or under the auspices of USEPA trained personnel who has completed the course Sampling of Hazardous Materials, offered by the Office of Emergency and Remedial Response. Separate QA/QC measures were implemented for each of the instruments used in soil-gas and soil sampling.

Separate QA/QC measures were implemented for each of the instruments used in the Sampling and Analysis Program. Sampling instruments included a stainless steel Geoprobe with probe sections, ponar grab, organic vapor analyzer and sample vessels.

Prior to arrival on the subject property and between sample locations, the probes sections and ponar grab were decontaminated by washing with a detergent (alconox/liquinox) and potable water solution with distilled water rinse. The organic vapor analyzer was calibrated prior to sampling using a span gas of known concentration. All sample vessels were "level A" certified decontaminated containers. Samples were placed into vessels consistent with the analytical parameters. After acquisition, samples were preserved in the field. All containerized samples were refrigerated to 4° C during transport.

A sample represents physical evidence, therefore, an essential part of liability reduction is the proper control of gathered evidence. To establish proper control, the following sample identification and chain-of-custody procedures were followed.

##### Sample Identification

Sample identification was executed by use of a sample tag, log book and manifest. Documentation provides the following:

1. Project Code
2. Sample Laboratory Number
3. Sample Preservation
4. Instrument Used for Source Soil Grabs
5. Composite Medium Used for Source Soil Grabs
6. Date Sample was Secured from Source Soil
7. Time Sample was Secured from Source Soil
8. Person Who Secured Sample from Source Soil

##### Chain-of-Custody Procedures

Due to the evidential nature of samples, possession was traceable from the time the samples were collected until they were received by the testing laboratory. A sample was considered under custody if:

It was in a person's possession, or  
It was in a person's view, after being in possession, or  
It was in a person's possession when they were to lock it up, or  
It is in a designated secure area.

When transferring custody, the individuals relinquishing and receiving signed, dated and noted the time of the Chain-of- Custody Form.

Laboratory Custody Procedures

A designated sample custodian accepted custody of the shipped samples and verified that the information on the sample tags matched that on the Chain-of-Custody records. Pertinent information as to shipment, pick-up, courier, etc. was entered in the "remarks" section. The custodian then entered the sample tag data into a bound logbook which was arranged by project code and station number.

The laboratory custodian used the sample tag number or assigned a unique laboratory number to each sample tag and assured that all samples were transferred to the proper analyst or stored in the appropriate source area.

The custodian distributed samples to the appropriate analysts. Laboratory personnel were responsible for the care and custody of samples from the time they were received until the sample was exhausted or returned to the custodian.

All identifying data sheets and laboratory records were retained as part of the permanent site record. Samples received by the laboratory were retained until after analysis and quality assurance checks were completed.

## 5.0 SUMMARY AND CONCLUSION

The Phase II Environmental Assessment sampling and analysis program was designed to determine the impact of the underground storage tanks and former land use applications have had on the quality of the subsoil and groundwater. The sampling and analysis plan included the acquisition of subsurface soil samples for stratigraphic logging and the acquisition of discrete subsurface soil and groundwater samples for field and laboratory analysis. The following presents an interpretation of the data collected during the sampling and analysis plan.

1. Field analysis of groundwater samples obtained from on-site monitoring wells has identified that there is a diurnal fluctuation of the elevation of the water table on the subject property. The fluctuation is a function of the tidal range of the Gowanus Canal. The maximum measured elevation change was measured to be 0.4 feet (see Groundwater Investigation, Appendix D). However, it is expected to show an elevation change of approximately 2 feet based on physical and temporal factors. The change in the water table elevation decreases to the east (away from the Gowanus Canal).

The constant change in the elevation of the water table dictates that the direction of groundwater flow across the subject property is constantly changing (flow direction being normal to the plane). This change will spread groundwater contaminants in various directions rather than just toward the Gowanus Canal. Consequently, contaminants from the Gowanus Canal can migrate into the saturated soils of the subject property. Field analysis of groundwater samples showing high salinity have confirmed the occurrence of this phenomenon.

2. The subsurface soil samples secured from the subject property were identified to have a high organic matter content (organic carbon). The organic matter was likely deposited from the filling and grading of the subject property with dredge spoil. The subsurface stratigraphic logs have demonstrated the existence of a heavily stained black layer of soil that exhibits horizontal continuity across the subject property. This layer exists just above and below the average measured elevation of the water table. In general, the layer decreased in thickness to the north and to the east. The thickness of the layer appears to be a function of the change in the elevation of the water table caused by tidal influences from the Gowanus Canal.
3. Field analysis (head space analysis) performed on the subsurface soil samples secured from probes around the former tanks within the VMF building, probe nodes SP-1, SP-2, SP-3, SP-4 and SP-5, detected significant concentrations of hydrocarbon contaminants in the soil immediately above the water table. These results suggest that the operation of the USTs caused the release of product to the subsurface soil. This supposition is supported by the results of the analysis performed on the soil samples secured from probe nodes SP-1, SP-2, SP-3, SP-4, SP-5 and SP-6 which detected concentrations of volatile and semivolatile organic contaminants exceeding the NYSDEC STARS regulatory level.

The individual contaminants detected are typical constituents of gasoline, diesel oil and coal tar petroleum products. To differentiate what product, or what combination of products was present in the soil, a sample of the black substratum was subjected to a qualification analysis by the laboratory (DRO/GRO Analysis). Said analysis involved correlating the peaks of the sample's chromatogram to standard peaks associated with gasoline, diesel oil and coal tar products.



The hydrocarbon range and peak ratios obtained from the test identified that a combination of all three petroleum products (gasoline, diesel oil and coal tar) is contaminating the soil beneath the VMF building. The horizontal extent of the contamination appears to have been limited due to the fact that the area is not subject to stormwater recharge (paved surfaces), the fine gradation of the soil and the high organic carbon content of the soil. The lack of recharge limits the transport mechanisms of the contaminants (solubility and gravimetric force). The soil gradation and carbon content increase the bond between the contaminants and the soil (adhesion and attenuation). This is demonstrated by the results obtained from the analysis of the subsurface soil sample obtained from probe node SP-6, and the relatively low (compared against the soil concentrations) contaminant concentrations detected in the groundwater samples obtained from probes and wells beneath and around the VMF (groundwater probe nodes GWP-1, GWP-2, GWP-3, GWP-4, GWP-6, MW-1, MW-2, MW-3, MW-4 and MW-5).

The vertical distribution of the contamination within the impacted area appears to have formed a band that has a variable thickness. The thickness of the band is most likely a function of the tidal range of the water table. The soil closest to the former tanks at nodes SP-1, SP-2, SP-3 and SP-4 appears to be impacted to an as yet undetermined depth below the water table (at its lowest elevation in the tidal cycle).

The concentrations of lead in the samples secured from probe nodes SP-1, SP-2, SP-4 and SP-5 were elevated above the expected background ranges for regional uncontaminated soil. These results suggest that the gasoline that was released contained lead alkyl additives. It is anticipated that the soil in the area of these samples will have concentrations of lead that will classify the soil as a hazardous waste (D-waste). This result should be given consideration during remedial activities.

Additionally, the mercury concentration in the soil sample obtained from probe node SP-5 was elevated significantly above the expected background range for regional soil. Such a concentration was not seen in any other location on the subject property. This result represents an anomaly in the analytical data. It is anticipated that the soil in the area of this probe node would have concentrations of mercury that will classify the soil as a hazardous waste (D-waste). This result should be given consideration during remedial activities. There are no known mercury sources identified in the Phase I or Phase II Environmental Site Assessments.

In summary, contaminant concentrations involving coal tar and other products were detected in soil beneath the VMF site. Coincidentally, the VMF site happens to present the greatest concern with regard to other contaminants resulting from a prior reported spill. This provides a means for remediation of both sources simultaneously.

4. Laboratory analysis performed on the subsurface soil samples secured from probes around the tanks within the DMU building, probe nodes SP-12 and SP-13, detected concentrations of volatile and semivolatile organic contaminants exceeding the NYSDEC STARS regulatory values. The individual contaminants detected are typical constituents of diesel oil and coal tar petroleum products. To differentiate what product, or what combination of products was present in the soil, a sample of the material was subjected to a qualification analysis by the laboratory (DRO/GRO Analysis). Said analysis involved correlating the peaks of the sample's chromatogram to standard peaks associated with diesel oil and coal tar products.

The hydrocarbon range and peak ratios obtained from the test indicate that diesel oil is contaminating the soil surrounding the tanks in the DMU building. The vertical distribution of the contamination was noted to extend beyond ten feet below existing grade. The horizontal extent of the contamination appears to have been limited due to the fact that the area is not subject to stormwater recharge (paved surfaces), the fine gradation of the soil and the high organic carbon content of the soil. The lack of recharge limits the transport mechanisms of the contaminants (solubility and gravimetric force). The soil gradation and carbon content increase the bond between the contaminants and the soil (adhesion and attenuation). This is demonstrated by the results obtained from the analysis of the subsurface soil sample obtained from probe node SP-6.

5. Laboratory analysis performed on the soil samples secured from within the area formerly occupied by the paint manufacturer, SP-10 and SP-11, detected concentrations of volatile and semivolatile organic contaminants. The semivolatile organic contaminants were detected at concentrations exceeding the NYSDEC STARS regulatory values. The volatile organic contaminants were detected at concentrations below the NYSDEC STARS regulatory values (the concentrations were marginally above the laboratory detection limits).

Additionally, concentrations of mercury were detected in the soil samples from probe nodes SP-10 and SP-11. The detected concentrations marginally exceeded background concentrations for regional uncontaminated soils. There are no known mercury sources identified in the Phase I or Phase II Environmental Site Assessments.

The organic and inorganic contaminants detected from samples obtained from probe nodes SP-10 and SP-11 are not consistent with typical paint manufacturing wastes, ingredients and/or byproducts. However, all of the detected contaminants are typical constituents of diesel oil. The detected contaminants are not typical constituents of coal tar or gasoline and many gasoline and coal tar indicator contaminants were not detected within these samples (contrary to what was found below the VMF building). Accordingly, it appears that diesel oil release from the underground heating oil tanks on the north side of the building has impacted the soil below the DMU.

6. A ground penetrating radar survey was performed in the area of the subject property identified as having been occupied by two underground storage tanks. The survey failed to identify any anomalies in the area that could be representative of an underground storage tank. Therefore, it would appear that both underground gasoline storage tanks have been removed from this portion of the subject property.

Laboratory analysis performed on the soil samples secured from the probes installed in the area that previously was occupied by the underground gasoline storage tanks, probe nodes SP-14 and SP-15, failed to detect any concentrations of volatile organic contaminants. However, the soil sample secured from probe node SP-14 detected one semivolatile organic compound that existed at a concentration that was below the NYSDEC STARS regulatory level. These results suggest the operation of the underground gasoline storage tanks did not cause the release of gasoline to the subject property.

7. Water quality analysis of groundwater samples obtained from the subject property identified marginal concentrations of groundwater contamination in areas outside of the two underground tank fields. These results confirm the poor mobility of the contaminants on the subject property.

In summary, soils beneath the DMU site appears to have been affected by release of oil from one (1) or more 10,000 gallon fuel oil tanks located beneath the north loading platform. Soils beneath the VMF site appear to have been affected by a prior documented spill location and other factors. Overall, the soil and groundwater have been contaminated from the leaking petrochemical contaminants from two of the three identified underground storage tank fields and to a lesser extent from coal tar residue which was detected primarily beneath the western part of the VMF site. The erratic movement of groundwater has smeared these petrochemical contaminants into the soil around these source areas. The contaminants within each of the smear zones are adhering to the soil due to site soil and drainage characteristics. This same situation has limited the extent and concentration of groundwater contamination on the subject property. The black layer of media on the subject property has horizontal continuity, however, it varies in its contaminant types and concentrations. It is expected that aggressive source remediation of soil contaminated by the documented spill on the VMF site will have a beneficial impact on sources related to coal tar residual.

The subject site has been evaluated with respect to the environmental concerns identified in the PART 1 and with the request for additional work regarding the spill event currently being investigated, and is in accordance with standard practice for the industry. This investigation report addresses only the specific areas of the site warranting further analysis and can only provide conclusions regarding the subsoil quality in those specific areas tested. The report is limited to the evaluation of site conditions at the time of completion of the field sampling program. Based upon this report, the limitations of this report and the methodology employed, it is concluded that additional site remediation activities are warranted to address the NYSDEC open spill file and contaminants identified on site as evaluated herein.

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*Date of Completion*  
NELSON, POPE & VOORHIS, LLC

---

*Charles J. Voorhis, CEP, AICP*  
Project Manager

## 6.0 REFERENCES

McGovern, Carol E., 1987, Background Concentrations of 20 Elements in Soils with Special Regard to New York State, NYSDEC Wildlife Pathology Unit, Delmar, New York 1987).

New York State Department of Environmental Conservation (NYSDEC), 1992, Sampling Guidelines and Protocols, Technology Background and Quality Control/Quality Assurance for NYSDEC Spill Response Program, NYSDEC, Albany, New York.

NYSDEC, 1993, Spill Technology and Remediation Series (STARS), Memo 1, Guidance Document for Petroleum Contaminated Soils, NYSDEC, Albany, New York.

NYSDEC, 1994, Technical Administrative Guidance Memorandum, HWR-94-4046, Determination of soil cleanup objectives and cleanup levels, Division of Hazardous Waste Remediation, Albany, New York.

# ATTACHMENTS

# ATTACHMENT A

## SOIL BORING LOGS



CODE: SP-7

[illegible]

Note: USCS (Unified Soil Classification System)

CODE: SP-8

[illegible]

**Note:** USCS (Unified Soil Classification System)



CODE: SP-9

Depth Below Grade [feet]	Color [Munsell]	Recovery	FID Reading [ppm]	Description [USCS]	Lithology	Description	Sample
0	10YR 2/2 Very Dark Brown				Asphalt		
2	10YR 3/3 Dark Brown				Fine to Medium		
3	10YR 2/1 Black				Fine to Medium Strong Odor		
4	10YR 2/1 Black				Fine to Medium Strong Odor		
5							

**Note: USCS (Unified Soil Classification System)**

CODE: SP-10

Depth Below Grade [feet]	Color [Munsell]	Recovery	FID Reading [ppm]	Description [USCS]	Lithology	Description	Sample
0						Asphalt	
	10YR 2/2 Very Dark Brown					Fine to Medium Brick Fines	
2							
	10YR 2/2 Very Dark Brown					Fine to Medium Brick Fines	
3							
	10YR 2/2 Very Dark Brown					Fine to Medium Brick Fines	
4							
	10YR 2/1 Black					Fine to Medium	
5							
	10YR 2/1 Black					Fine to Medium	
6							
	10YR 2/1 Black					Fine to Medium	
7							
	10YR 2/1 Black					Fine to Medium	
8							

**Note:** USCS (Unified Soil Classification System)

CODE: SP-11

Depth Below Grade [feet]	Color [Munsell]	Recovery	FID Reading [ppm]	Description [USCS]	Lithology	Description	Sample
0	10YR 2/2 Very Dark Brown					Asphalt	
2	10YR 2/2 Very Dark Brown					Fine to Medium Brick Fines	
3	10YR 2/2 Very Dark Brown					Fine to Medium Brick Fines	
4	10YR 2/2 Very Dark Brown					Fine to Medium Brick Fines	
5	10YR 2/1 Black					Fine to Medium	
6	10YR 2/1 Black					Fine to Medium	
7	10YR 2/1 Black					Fine to Medium	
8	10YR 2/1 Black					Fine to Medium	
9	10YR 2/2 Very Dark Brown					Fine to Medium	
10	10YR 2/2 Very Dark Brown					Fine to Medium	

Note: USCS (Unified Soil Classification System)

# TEST BORING / PROBE LOG

CODE: SP-12

Site Location:	Brooklyn	Installer:	Impact Environmental
Job Number:	97-070	Installation Method:	Geoprobe
Client:	NPV	Date Begin/End:	5/7/97
Client Contact:	Charles Voorhis	Surface Elevation:	
Boring Code:	SP-12	Depth to Water:	
Location Description:		Total Depth:	10 feet
Geologist:	James Mulvey	Page #:	1

Depth Below Grade [feet]	Color [Munsell]	Recovery	FID Reading [ppm]	Description [USCS]	Lithology	Description	Sample
0	10YR 5/6 Yellowish Brown					Asphalt	
2						Brick Fines	
3	10YR 5/6 Yellowish Brown					Brick Fines	
4	10YR 5/6 Yellowish Brown					Brick Fines	
5	10YR 5/6 Yellowish Brown					Brick Fines	
6	10YR 4/8 Red					Hard Red Clay	
7	10YR 2/2 Very Dark Brown					Fine to Medium Strong Odor	
8	10YR 2/1 Black					Fine to Medium Strong Odor	
9	10YR 2/1 Black					Fine to Medium Strong Odor	
10	10YR 2/2 Very Dark Brown					Fine to Medium Strong Odor	

Note: USCS (Unified Soil Classification System)

# TEST BORING / PROBE LOG

CODE: SP-13

Site Location:	Brooklyn	Installer:	Impact Environmental
Job Number:	97-070	Installation Method:	Geoprobe
Client:	NPV	Date Begin/End:	5/7/97
Client Contact:	Charles Voorhis	Surface Elevation:	
Boring Code:	SP-13	Depth to Water:	
Location Description:		Total Depth:	10 feet
Geologist:	James Mulvey	Page #:	1

Depth Below Grade [feet]	Color [Munsell]	Recovery	FID Reading [ppm]	Description [USCS]	Lithology	Description	Sample
0	10YR 5/6 Yellowish Brown					Asphalt	
2						Brick Fines	
3	10YR 5/6 Yellowish Brown					Brick Fines	
4	10YR 5/6 Yellowish Brown					Brick Fines	
5	10YR 5/6 Yellowish Brown					Brick Fines	
6	10YR 4/8 Red					Hard Red Clay	
7	10YR 2/2 Very Dark Brown					Fine to Medium Strong Odor	
8	10YR 2/1 Black					Fine to Medium Strong Odor	
9	10YR 2/1 Black					Fine to Medium Strong Odor	
10	10YR 2/2 Very Dark Brown					Fine to Medium Strong Odor	

Note: USCS (Unified Soil Classification System)

# TEST BORING / PROBE LOG

CODE: SP-16

Site Location:	Brooklyn	Installer:	Impact Environmental
Job Number:	97-070	Installation Method:	Geoprobe
Client:	Brooklyn	Date Begin/End:	5/5/97
Client Contact:	Charles Voorhis	Surface Elevation:	
Boring Code:	SP-16	Depth to Water:	
Location Description:		Total Depth:	8 feet
Geologist:	James Mulvey	Page #:	1

Depth Below Grade [feet]	Color [Munsell]	Recovery	FID Reading [ppm]	Description [USCS]	Lithology	Description	Sample
0						Asphalt	
2	10YR 2/2 Very Dark Brown					Fine to Medium	
3	10YR 2/2 Very Dark Brown					Fine to Medium	
4	10YR 2/1 Black					Fine to Medium Strong Odor	
5	10YR 2/1 Black					Fine to Medium Strong Odor	
6	10YR 2/1 Black					Fine to Medium Strong Odor	
7	10YR 2/1 Black					Fine to Medium Strong Odor	
8	10YR 2/1 Black					Fine to Medium Strong Odor	

Note: USCS (Unified Soil Classification System)

CODE: SP-17

Depth Below Grade [feet]	Color [Munsell]	Recovery	FID Reading [ppm]	Description [USCS]	Lithology	Description	Sample
-----------------------------------	--------------------	----------	-------------------------	-----------------------	-----------	-------------	--------

Note: USCS (Unified Soil Classification System)

CODE: SP-18

Site Location:	Brooklyn	Installer:	Impact Environmental
Job Number:	97-070	Installation Method:	Geoprobe
Client:	Brooklyn	Date Begin/End:	5/5/97
Client Contact:	Charles Voorhis	Surface Elevation:	
Boring Code:	SP-18	Depth to Water:	
Location Description:		Total Depth:	7 feet
Geologist:	James Mulvey	Page #:	1

Note: USCS (Unified Soil Classification System)



CODE: SP-19

Brooklyn

Impact Environmental

97-070

Geoprobe

Brooklyn

Date Begin/End: 5/5/97

Charles Voorhis

**Surface Elevation:**

SP-19

**Depth to Water:**

**Total Depth:** 7 feet

Page #: 1

[illegible]

Note: USCS (Unified Soil Classification System)

CODE: SP-20

Depth Below Grade [feet]	Color [Munsell]	Recovery	FID Reading [ppm]	Description [USCS]	Lithology	Description	Sample
0						Asphalt	
3	10YR 1/1 Black					1/4 " Blue Gravel Stone	
4	10YR 1/1 Black					Pieces of Anthracite	
	REFUSAL						

Note: USCS (Unified Soil Classification System)

# TEST BORING / PROBE LOG

CODE: SP-21

Site Location: Brooklyn

Installer: Impact Environmental

Job Number: 97-070

Installation Method: Geoprobe

Client: Brooklyn

Date Begin/End: 5/5/97

Client Contact: Charles Voorhis

**Surface Elevation:**

Boring Code: SP-21

**Depth to Water:**

**Location Description:**

**Total Depth:** 7 feet

Geologist: James Mulvey

Page #: 1

[illegible]

Note: USCS (Unified Soil Classification System)

CODE: SP-22

[illegible]

Note: USCS-(Unified Soil Classification System)

# ATTACHMENT B

## LABORATORY DATA SHEETS

## **Analytical Data Reports GWP 1, 2, 3, 4 and 6**

INDUSTRIAL CORROSION MANAGEMENT, Inc.  
1152 Route 10  
Randolph, NJ 07869  
201-534-0330  
April 30, 1997

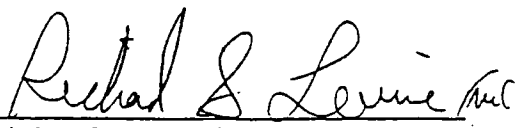
Certified for: NJ, PA, DE, CT, NY (DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

ANALYTICAL DATA REPORT PACKAGE

Client: IMPACT ENVIRONMENTAL  
Sampled By: Customer

SAMPLE ID:	MATRIX	LAB NUMBER	DATE & TIME COLLECTED	AT LAB DATE
GWP-1	Aqueous	260195	04/05/97	04/09/97
GWP-2	Aqueous	260196	04/05/97	04/09/97
GWP-3	Aqueous	260197	04/05/97	04/09/97
GWP-4	Aqueous	260198	04/05/97	04/09/97
GWP-6	Aqueous	260199	04/05/97	04/09/97

Supervisor/Manager Signature:

  
Richard S. Levine

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SUS

# ICM LABORATORIES

# CHAIN OF CUSTODY REPORT

<b>CLIENT:</b> <u>Impact</u> <b>ADDRESS:</b> <u>46 East Northport Rd</u> <u>Kings Park, NY 11754</u> <b>PHONE:</b> <u>516.269.8800</u> <b>PROJECT:</b> <u>97070</u> <b>PROJ. MGR.:</b> <u>RP</u>	<b>BILL TO:</b> <u>Impact</u> <b>SEND REPORT TO:</b> <u>Impact</u> <b>IN CASE OF QUESTIONS UPON SAMPLE RECEIPT CALL:</b> <b>PHONE:</b> <u>516.269.8800</u>	<b>DELIVERABLES:</b> <input type="checkbox"/> REDUCED DELIVERABLES FROM CIP FORM <input type="checkbox"/> REDUCED DEL. CIP FORM <input type="checkbox"/> REGULATORY FORM <input type="checkbox"/> FULL DEL. CIP FORM <input checked="" type="checkbox"/> FIDES <input checked="" type="checkbox"/> STATE (CIP IS REQUIRED)	<b>TURNOVER TIME</b> <b>FAX (PRELIMINARIES)</b> <u>516.269.1599</u> <b>HARD COPY</b> _____ <b>COOLER TEMP</b> <u>2.7°C</u>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------

LABORATORY ID CODE	SAMPLE IDENTIFICATION	SAMPLE DATE	SAMPLE TIME	COMPOSITE	SAMPLE MATRIX					# OF BOTTLES	ANALYSIS					PRESERVATIVES									
					SOLID	LIQUID	SLUDGE	OTHER	USEPA 601		USEPA 625 (BOD5)	USEPA 403 200 (WATER)	Cyanide							HSC	HNC,	HC	NACH	OTHER	
260195	GWP-1*	4/5				X				2	X	X	X	X											
196	GWP-2*	4/5				X				2	X	X	X	X											
197	GWP-3*	4/5				X				2	X	X	X	X											
198	GWP-4*	4/5				X				2	X	X	X	X											
✓ 199	GWP-6	4/2				X				3	X	X	X	X											

<b>SAMPLED BY:</b> <u>Jim Mulvey</u> <b>RELINQUISHED BY:</b> <u>Rich Franzen</u> <b>RECEIVED BY:</b> <u>Rich Franzen</u> <b>RELINQUISHED BY:</b> <u>Rich Franzen</u> <b>RECEIVED BY:</b> _____ <b>RELINQUISHED BY:</b> _____ <b>RECEIVED BY:</b> _____	<b>DATE:</b> <u>4/2/97</u> <b>TIME:</b> <u>4/5/97</u> <b>DATE:</b> <u>4/8/97</u> <b>TIME:</b> <u>4-8-97</u> <b>DATE:</b> <u>4-9-97</u> <b>TIME:</b> <u>0950</u>	<b>COMMENTS:</b> <u>* Only 1 vial rec'd</u> <u>*** No bottles rec'd for Cyanide &amp; Metals</u> <u>Cyanide, metals canceled as per Rich Franzen 4/16/97</u> <b>COMPOUND LIST</b> <input type="checkbox"/> PRIORITY FORM <input type="checkbox"/> TARGET COMPOUND LIST <input type="checkbox"/> TRACE ANALYSIS <input type="checkbox"/> OTHER _____ <b>CONCENTRATIONS EXPECTED</b> <input type="checkbox"/> HIGH <input type="checkbox"/> IS SAMPLE CHLORINATED? <input type="checkbox"/> MEDIUM <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> LOW <input type="checkbox"/> KNOWN HAZARD _____	<b>ANALYSIS:</b> <u>*** Analysis changed to 601</u> <u>as per Rich Franzen 4/16/97</u> <u>*** Run plans on (11/12/97)</u> <u>Base Neutral Samples 4/16/97</u>
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LINK: 300195-300199

Count Number: WA2748  
Project: 97-070  
Tier Level: NY A

## IMPACT ENVIRONMENTAL

Laboratory Person Breaking Seal on Shuttle: ... *Paul Jones* ...

Title: Legs

[illegible]

INDUSTRIAL CORROSION MANAGEMENT, INC.  
1152 Route 10  
Randolph, NJ 07969  
201-584-0330, FAX: 201-584-0515

Certified for: NJ, PA, DE, CT, NY DOH  
NJ #14115 NY #11376  
US EPA CLP Lab

LABORATORY CHRONICLE

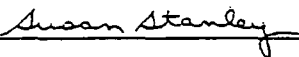
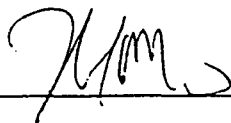
DATE SAMPLED: 04/05/97 PRESERVATIVE: 4 degrees C  
DATE RECEIPT: 04/09/97

GC/MS SEMI-VOLATILES:

LAB ID #	DATE EXTRACTED	DATE ANALYZED
260195	04/11/97	04/15/97
260196	04/11/97	04/15/97 04/17/97
260197	04/11/97	04/15/97 04/17/97
260198	04/11/97	04/15/97 04/17/97
260199	04/11/97	04/15/97

DEPT. SUPERVISOR:

QA REVIEW & APPROVAL:



INDUSTRIAL CORROSION MANAGEMENT, INC.  
1152 Route 10  
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201-584-0330, FAX: 201-584-0515

Certified for: NJ, PA, DE, CT, NY, OH  
NC #14116 NY #11176  
US EPA CLP Lab

LABORATORY CHRONICLE

DATE SAMPLED: 04/05/97 PRESERVATIVE: 4 degrees C  
DATE RECEIPT: 04/09/97

8021 VOLATILE:

LAB ID #	DATE ANALYZED
260195	04/16/97
260196	04/16/97
260197	04/15/97
260198	04/16/97
260199	04/16/97

DEPT. SUPERVISOR:

M. Bacon

QA REVIEW & APPROVAL:

Susan Stanley

INDUSTRIAL CORROSION MANAGEMENT, INC.  
1152 Route 10  
Randolph, NJ 07869  
201-584-0330

NJ DEP and PA DEP Certified.  
NJ DEP Lab ID# 14116  
US EPA Historic CLP Lab

CONFORMANCE/NONCONFORMANCE SUMMARY CHECKLIST

Lab Numbers: 260175-260199

Volatile Organics: Analyzed ☒ Not Analyzed ☐

All tunes were run in required frequency. Yes ☒ No ☐ N/A ☐

All tune m/z ratios met criteria. Yes ☒ No ☐ N/A ☐

All initial and/or continuing calibrations were run in required frequency. Yes ☒ No ☐

All calibration SPCCs and CCCs met criteria. Yes ☐ No ☐ N/A ☒

Surrogate recoveries met QC criteria. Yes ☒ No ☐

All method blanks met contamination criteria. Yes ☒ No ☐

All samples were analyzed within the required holding times.  
Yes ☒ No ☐

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Semi-volatile Organics: Analyzed ☒ Not Analyzed ☐

All tunes were run in required frequency. Yes ☒ No ☐ N/A ☐

All tune m/z ratios met criteria. Yes ☒ No ☐ N/A ☐

All initial and/or continuing calibrations were run in required frequency. Yes ☒ No ☐

All calibration SPCCs and CCCs met criteria. Yes ☐ No ☐ N/A ☒

Surrogate recoveries met QC criteria. Yes ☒ No ☐

All method blanks met contamination criteria. Yes ☒ No ☐

All samples were extracted and analyzed within the required holding times. Yes ☒ No ☐

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6

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1152 Route 10  
Randolph, NJ 07869  
201-584-0330

NJ DEP and PA DER Certified.  
NJ DEP Lab ID# 14116  
US EPA Historic CLP Lab

CONFORMANCE/NONCONFORMANCE SUMMARY CHECKLIST

Lab Numbers: 260195-260199

Pesticides/PCBs: Analyzed ☐ Not Analyzed ☒

All method blanks met contamination criteria. Yes ☐ No ☐

All samples were extracted and analyzed within the required holding times. Yes ☐ No ☐

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Metals: Analyzed ☐ Not Analyzed ☒

All method blanks met contamination criteria. Yes ☐ No ☐

All samples were analyzed within the required holding times.  
Yes ☐ No ☐

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Petroleum Hydrocarbons: Analyzed ☐ Not Analyzed ☒

All samples were extracted and analyzed within the required holding times. Yes ☐ No ☐

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

NJ DEP and PA DER Certified.  
NJ DEP Lab ID# 14116  
US EPA Historic CLP Lab

Lab Numbers: 260195-260199

General Chemistry: Analyzed\_\_\_\_ Not Analyzed\_\_\_\_

All samples were analyzed within the required holding times.  
Yes\_\_\_\_\_ No\_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Susan Stanley  
Quality Assurance Coordinator

4/29/97  
Date

emi-volatiles

- \*40 Code of Federal Regulations
- \*\*Method 625

GC/MS Extraction - Separatory Funnel Extraction

- \*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition
- \*\*Method 3510B

Halogenated Volatiles by GC-PID and Hall detectors

- \*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition
- \*\*Method 8021A

- \* Indicates reference.
- \*\* Indicates method.

INDUSTRIAL CORROSION MANAGEMENT, INC.  
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201-584-0330, FAX: 201-584-0515  
APRIL 16, 1997

Certified for: NJ, PA, DE, CT, MICHIGAN  
NJ #14116 NY #11376  
US EPA CLP Lab

POLYNUCLEAR AROMATIC HYDROCARBON ANALYSIS BY GC/MS

Lab Number: 260195 Data File: >FS468  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: GWP-1  
Sample date: 04/05/97 Extracted Date: 04/11/97  
Sampled by: Customer Analysis Date: 04/15/97 Column: 30m SPB-5  
At lab date: 04/09/97 Dilution Factor: 10  
Matrix: Water Init Sample volume= 1000ml Final volume= 10ml

Conc. in Sample = (Conc. on Quant Report/Initial Volume)\*Final Volume\*1000

Parameter	Result ug/l	Method Blank ug/l	Practical Quantitation Limit ug/l	Minimum Detection Limit ug/l
Naphthalene	270	U	50	20
Acenaphthylene	78	U	50	15
Acenaphthene	24	U	50	19
Fluorene	90	U	50	17
Phenanthrene	290	U	50	9
Anthracene	43	U	50	8
Fluoranthene	140	U	50	6
Pyrene	300	U	50	5
Benzo(a)anthracene	110	U	50	5
Chrysene	150	U	50	5
Benzo(b)fluoranthene	120	U	50	7
Benzo(k)fluoranthene	U	U	50	7
Benzo(a)pyrene	93	U	50	5
Indeno(1,2,3-cd)pyrene	31	U	50	11
Dibenz(a,h)anthracene	U	U	50	5
Benzo(g,h,i)perylene	36	U	50	5

ug/l = micrograms/liter or ppb

ND: Not Determined.  
IND: Indeterminable.

U: Indicates a compound was analyzed for but not detected at the MDL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

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Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0815  
APRIL 19, 1997

Certified for: NJ, PA, DE, CT, NY DOH  
NJ #14116 NY #11376  
US EPA CLP Lab

COMPLIANCE MONITORING FOR VOLATILE ORGANICS Method 8021

Lab Number: 260195  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: GWP-1  
Sample date: 04/05/97  
Sampled by: Customer  
At lab date: 04/09/97  
Matrix: Water  
Instrument: GC 565  
Analysis Date: 04/16/97  
Column: RTX-502.2-0.53MM  
Dilution Factor: 5

Init Sample vol= 1ml Final volume= 5ml

Conc. in Sample = (Conc. on Quant Report/Initial Volume)\*Final Volume

Parameter	Result ug/l	Method Blank ug/l	Practical Quantitation Limit ug/l	Minimum Detection Limit ug/l
Benzene	8.7	U	5	2
Ethylbenzene	U	U	5	2.5
Toluene	6.3	U	5	2
o-Xylene	7.1	U	5	4
m+p-Xylene	6.6	U	5	4.5
Isopropylbenzene	U	U	5	2.5
n-Propylbenzene	U	U	5	4.5
p-Isopropyltoluene	U	U	5	2.5
1,2,4-Trimethylbenzene	8.7	U	5	2
1,3,5-Trimethylbenzene	U	U	5	3.5
n-Butylbenzene	U	U	5	2.5
sec-Butylbenzene	U	U	5	2.5
Naphthalene	140	U	5	2.5
MTBE	U	U	5	2.5
t-Butyl-benzene	U	U	5	2.5

ug/l = micrograms/liter or ppb

U: Indicates a compound was analyzed for but not detected at the MDL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

WJ 4/19/97

ND: Not Determined.

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APRIL 17, 1997

Certified for: NJ, PA, DE, CT, NY, OH  
NJ #14115 NY #11376  
US EPA CLP Lab

POLYNUCLEAR AROMATIC HYDROCARBON ANALYSIS BY GC/MS

Lab Number: 260196 Data File: >F9469  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: GWP-2  
Sample date: 04/05/97 Extracted Date: 04/11/97  
Sampled by: Customer Analysis Date: 04/15/97 Column: 30m SPB-5  
At lab date: 04/09/97 Dilution Factor: 10  
Matrix: Water Init Sample volume= 1000ml Final volume= 10ml

Conc. in Sample = (Conc. on Quant Report/Initial Volume)\*Final Volume\*1000

Parameter	Result ug/l	Method Blank ug/l	Practical Quantitation Limit ug/l	Minimum Detection Limit ug/l
Naphthalene	3200	U	50	20
Acenaphthylene	390	U	50	15
Acenaphthene	360	U	50	19
Fluorene	980	U	50	17
Phenanthrene	3000	U	50	9
Anthracene	430	U	50	8
Fluoranthene	1100	U	50	6
Pyrene	1700	U	50	5
Benzo(a)anthracene	640	U	50	5
Chrysene	760	U	50	5
Benzo(b)fluoranthene	560	U	50	7
Benzo(k)fluoranthene	U	U	50	7
Benzo(a)pyrene	410	U	50	5
Indeno(1,2,3-cd)pyrene	85	U	50	11
Dibenz(a,h)anthracene	44	U	50	5
Benzo(g,h,i)perylene	98	U	50	5

ug/l = micrograms/liter or ppb

ND: Not Determined.  
IND: Indeterminable.

U: Indicates a compound was analyzed for but not detected at the MDL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

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1152 Route 10  
Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515  
APRIL 19, 1997

Certified for: NJ, PA, DE, CT, NY, DC  
NJ #14116 NY #11376  
US EPA CLP Lab

COMPLIANCE MONITORING FOR VOLATILE ORGANICS Method 8001

Lab Number: 260196  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: GWP-2  
Sample date: 04/05/97  
Sampled by: Customer  
At lab date: 04/09/97  
Matrix: Water  
Instrument: GC 565  
Analysis Date: 04/16/97  
Column: RTX-502.2-0.53MM  
Dilution Factor: 50

Init Sample vol= 0.1ml Final volume= 5ml

Conc. in Sample = (Conc. on Quant Report/Initial Volume)\*Final Volume

Parameter	Result ug/l	Method Blank ug/l	Practical Quantitation Limit ug/l	Minimum Detection Limit ug/l
Benzene	150	U	50	20
Ethylbenzene	21J	U	50	25
Toluene	44J	U	50	20
o-Xylene	68	U	50	40
m+p-Xylene	76	U	50	45
Isopropylbenzene	U	U	50	25
n-Propylbenzene	U	U	50	45
p-Isopropyltoluene	U	U	50	25
1,2,4-Trimethylbenzene	80	U	50	20
1,3,5-Trimethylbenzene	U	U	50	35
n-Butylbenzene	U	U	50	25
sec-Butylbenzene	U	U	50	25
Naphthalene	1200	U	50	25
MTBE	U	U	50	25
t-Butyl-benzene	U	U	50	25

ug/l = micrograms/liter or ppb

U: Indicates a compound was analyzed for but not detected at the MDL.

J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.

B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination. *4/19/97*

ND: Not Determined.

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INDUSTRIAL CORROSION MANAGEMENT, INC.  
1152 Route 10  
Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515  
APRIL 17, 1997

Certified for: NJ, PA, DE, CT, NY, DC, HI  
NJ #14116 NY #11375  
US EPA CLP Lab

POLYNUCLEAR AROMATIC HYDROCARBON ANALYSIS BY GC/MS

Lab Number: 260197 Data File: >F8470  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: GWP-3  
Sample date: 04/05/97 Extracted Date: 04/11/97  
Sampled by: Customer Analysis Date: 04/15/97 Column: 30m SPB-5  
At lab date: 04/09/97 Dilution Factor: 10  
Matrix: Water Init Sample volume= 1000ml Final volume= 10ml

Conc. in Sample = (Conc. on Quant Report/Initial Volume)\*Final Volume\*1000


Parameter	Result ug/l	Method Blank ug/l	Practical Quantitation Limit ug/l	Minimum Detection Limit ug/l
Naphthalene	3300	U	50	20
Acenaphthylene	160	U	50	15
Acenaphthene	140	U	50	19
Fluorene	470	U	50	17
Phenanthrene	920	U	50	9
Anthracene	220	U	50	8
Fluoranthene	280	U	50	6
Pyrene	560	U	50	5
Benzo(a)anthracene	210	U	50	5
Chrysene	250	U	50	5
Benzo(b)fluoranthene	170	U	50	7
Benzo(k)fluoranthene	U	U	50	7
Benzo(a)pyrene	160	U	50	5
Indeno(1,2,3-cd)pyrene	29	U	50	11
Dibenz(a,h)anthracene	17	U	50	5
Benzo(g,h,i)perylene	40	U	50	5

ug/l = micrograms/liter or ppb

ND: Not Determined.  
IND: Indeterminable.

U: Indicates a compound was analyzed for but not detected at the MDL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

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INDUSTRIAL CORROSION MANAGEMENT, INC.  
 1152 Route 10  
 Randolph, NJ 07869  
 201-584-0330, FAX: 201-584-0515  
 APRIL 19, 1997

Certified for: NJ, PA, DE, CT, NY (DOH)  
 NJ #14116 NY #11376  
 US EPA CLP Lab

COMPLIANCE MONITORING FOR VOLATILE ORGANICS Method 8021

Lab Number: 260197  
 Client: IMPACT ENVIRONMENTAL  
 Sample source: 97-070  
 Sample ID: GWP-3  
 Sample date: 04/05/97  
 Sampled by: Customer  
 At lab date: 04/09/97  
 Matrix: Water  
 Instrument: GC 565  
 Analysis Date: 04/15/97  
 Column: RTX-502.2-0.53MM  
 Dilution Factor: 100

Init Sample vol= 0.05ml Final volume= 5ml

Conc. in Sample = (Conc. on Quant Report/Initial Volume)\*Final Volume

Parameter	Result ug/l	Method Blank ug/l	Practical Quantitation Limit ug/l	Minimum Detection Limit ug/l
Benzene	300	U	100	40
Ethylbenzene	58J	U	100	50
Toluene	U	U	100	40
o-Xylene	U	U	100	80
m+p-Xylene	120	U	100	90
Isopropylbenzene	U	U	100	50
n-Propylbenzene	U	U	100	90
p-Isopropyltoluene	U	U	100	50
1,2,4-Trimethylbenzene	170	U	100	40
1,3,5-Trimethylbenzene	U	U	100	70
n-Butylbenzene	U	U	100	50
sec-Butylbenzene	U	U	100	50
Naphthalene	2000	U	100	50
MTBE	U	U	100	50
t-Butyl-benzene	U	U	100	50

ug/l = micrograms/liter or ppb

U: Indicates a compound was analyzed for but not detected at the MDL.  
 J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
 B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

ND: Not Determined.

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INDUSTRIAL CORROSION MANAGEMENT, INC.  
1152 Route 10  
Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515  
APRIL 29, 1997

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

POLYNUCLEAR AROMATIC HYDROCARBON ANALYSIS BY GC/MS

Lab Number: 260198 Data File: >FS471  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: GWP-4  
Sample date: 04/05/97 Extracted Date: 04/11/97  
Sampled by: Customer Analysis Date: 04/15/97 Column: 30m SPB-5  
At lab date: 04/09/97 Dilution Factor: 10  
Matrix: Water Init Sample volume= 1000ml Final volume= 10ml

Conc. in Sample = (Conc. on Quant Report/Initial Volume)\*Final Volume\*1000

Parameter	Result ug/l	Method Blank ug/l	Practical Quantitation Limit ug/l	Minimum Detection Limit ug/l
Naphthalene	4500	U	50	20
Acenaphthylene	420	U	50	15
Acenaphthene	310	U	50	19
Fluorene	1100	U	50	17
Phenanthrene	2100	U	50	9
Anthracene	550	U	50	8
Fluoranthene	620	U	50	6
Pyrene	1500	U	50	5
Benzo(a)anthracene	570	U	50	5
Chrysene	640	U	50	5
Benzo(b)fluoranthene	510	U	50	7
Benzo(k)fluoranthene	U	U	50	7
Benzo(a)pyrene	460	U	50	5
Indeno(1,2,3-cd)pyrene	77	U	50	11
Dibenz(a,h)anthracene	43	U	50	5
Benzo(g,h,i)perylene	86	U	50	5

ug/l = micrograms/liter or ppb

ND: Not Determined.  
IND: Indeterminable.

U: Indicates a compound was analyzed for but not detected at the MDL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

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INDUSTRIAL CORROSION MANAGEMENT, INC.  
1152 Route 10  
Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515  
APRIL 19, 1997

Certified for: NJ, PA, DE, CT, NY (DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

COMPLIANCE MONITORING FOR VOLATILE ORGANICS Method 8021

Lab Number: 260198  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: GWP-4  
Sample date: 04/05/97  
Sampled by: Customer  
At lab date: 04/09/97  
Matrix: Water  
Instrument: GC 565  
Analysis Date: 04/16/97  
Column: RTX-502.2-0.53MM  
Dilution Factor: 100

Init Sample vol= 0.05ml Final volume= 5ml

Conc. in Sample = (Conc. on Quant Report/Initial Volume)\*Final Volume

Parameter	Result ug/l	Method Blank ug/l	Practical Quantitation Limit ug/l	Minimum Detection Limit ug/l
Benzene	300	U	100	40
Ethylbenzene	56J	U	100	50
Toluene	U	U	100	40
o-Xylene	U	U	100	80
m+p-Xylene	110	U	100	90
Isopropylbenzene	U	U	100	50
n-Propylbenzene	U	U	100	90
p-Isopropyltoluene	U	U	100	50
1,2,4-Trimethylbenzene	170	U	100	40
1,3,5-Trimethylbenzene	U	U	100	70
n-Butylbenzene	U	U	100	50
sec-Butylbenzene	U	U	100	50
Naphthalene	2600	U	100	50
MTBE	U	U	100	50
t-Butyl-benzene	U	U	100	50

ug/l = micrograms/liter or ppb

U: Indicates a compound was analyzed for but not detected at the MDL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

Rev 4/1/97

ND: Not Determined.

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Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515  
APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY (DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

POLYNUCLEAR AROMATIC HYDROCARBON ANALYSIS BY GC/MS

Lab Number: 260199 Data File: >F8467  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: GWP-6  
Sample date: 04/05/97 Extracted Date: 04/11/97  
Sampled by: Customer Analysis Date: 04/15/97 Column: 30m SPB-5  
At lab date: 04/09/97 Dilution Factor: 1  
Matrix: Water Init Sample volume= 1000ml Final volume= 1ml

Conc. in Sample = (Conc. on Quant Report/Initial Volume)\*Final Volume\*1000

Parameter	Result ug/l	Method Blank ug/l	Practical Quantitation Limit ug/l	Minimum Detection Limit ug/l
Naphthalene	32	U	5	2
Acenaphthylene	4	U	5	1.5
Acenaphthene	9.7	U	5	1.9
Fluorene	10	U	5	1.7
Phenanthrene	17	U	5	0.9
Anthracene	3.7	U	5	0.8
Fluoranthene	10	U	5	0.6
Pyrene	12	U	5	0.5
Benzo(a)anthracene	4	U	5	0.5
Chrysene	4.5	U	5	0.5
Benzo(b)fluoranthene	4.8	U	5	0.7
Benzo(k)fluoranthene	U	U	5	0.7
Benzo(a)pyrene	3.5	U	5	0.5
Indeno(1,2,3-cd)pyrene	1.6	U	5	1.1
Dibenz(a,h)anthracene	U	U	5	0.5
Benzo(g,h,i)perylene	1.8	U	5	0.5

ug/l = micrograms/liter or ppb

ND: Not Determined.  
IND: Indeterminable.

U: Indicates a compound was analyzed for but not detected at the MDL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

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APRIL 29, 1997

Certified for: NJ, PA, DE, CT, NY (DOH)  
NJ #14116 NY #11375  
US EPA CLP Lab

COMPLIANCE MONITORING FOR VOLATILE ORGANICS Method 8021

Lab Number: 260199  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: GWP-6  
Sample date: 04/05/97  
Sampled by: Customer  
At lab date: 04/09/97  
Matrix: Water  
Instrument: GC 565  
Analysis Date: 04/16/97  
Column: RTX-502.2-0.53MM  
Dilution Factor: 5

Init Sample vol= 1ml Final volume= 5ml

Conc. in Sample = (Conc. on Quant Report/Initial Volume)\*Final Volume

Parameter	Result ug/l	Method Blank ug/l	Practical Quantitation Limit ug/l	Minimum Detection Limit ug/l
Benzene	U	U	5	2
Ethylbenzene	1.7J	U	5	2.5
Toluene	U	U	5	2
o-Xylene	U	U	5	4
m+p-Xylene	U	U	5	4.5
Isopropylbenzene	U	U	5	2.5
n-Propylbenzene	U	U	5	4.5
p-Isopropyltoluene	U	U	5	2.5
1,2,4-Trimethylbenzene	2.7J	U	5	2
1,3,5-Trimethylbenzene	U	U	5	3.5
n-Butylbenzene	3.9J	U	5	2.5
sec-Butylbenzene	U	U	5	2.5
Naphthalene	120	U	5	2.5
MTBE	U	U	5	2.5
t-Butyl-benzene	U	U	5	2.5

ug/l = micrograms/liter or ppb

- U: Indicates a compound was analyzed for but not detected at the MDL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

ND: Not Determined.

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**Analytical Data Reports  
SP-1, 2, 3, 4, 5, 6**



INDUSTRIAL CORROSION MANAGEMENT, Inc.  
1152 Route 10  
Randolph, NJ 07869  
201-584-0330  
April 29, 1997


Certified for: NJ, PA, DE, CT, NY (DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

ANALYTICAL DATA REPORT PACKAGE

Client: IMPACT ENVIRONMENTAL  
Sampled By: Customer

SAMPLE ID:	MATRIX	LAB NUMBER	DATE & TIME COLLECTED	AT LAB DATE
SP-1	Soil	260189	04/05/97	04/09/97
SP-2	Soil	260190	04/05/97	04/09/97
SP-3	Soil	260191	04/05/97	04/09/97
SP-4	Soil	260192	04/05/97	04/09/97
SP-5	Soil	260193	04/05/97	04/09/97
SP-6	Soil	260194	04/02/97	04/09/97

Supervisor/Manager Signature:

  
Richard S. Levine

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## CHAIN OF CUSTODY REPORT

15 ICAI 1989

ICM Laboratories, Inc.  
Internal Chain-of-Custody

INK: 260189-260194

Count number: WA2748  
Object: 97-070  
Per Level: NY A

IMPACT ENVIRONMENTAL

Laboratory Person Breaking Seal on Shuttle: *Paul Jones* PS

Title: *Lead*

Number	Relinq. By	Recd. By	Date	Time	Reason for Transfer	Aliquot ID
ALL	<i>PS</i>	<i>B</i>	04/09/97	1723	STORAGE	ALL
ALL	<i>B</i>	<i>VN</i>	4/10/97	0845	CN	4U2
ALL	<i>VN</i>	<i>B</i>	4/10/97	1200	STORAGE	4U2
ALL	<i>B</i>	<i>YQ</i>	4/11/97	1130	BC21	4U1
ALL	<i>YQ</i>	<i>B</i>	4/22/97	0930	STORAGE	4U1
ALL	<i>B</i>	<i>7.2</i>	4/11/97	1200	BN	4U3
ALL	<i>7.2</i>	<i>B</i>	4/11/97	2000	STORAGE	4U3
ALL	<i>B</i>	<i>MJ</i>	4/11/97	1230	METALS	4U2
ALL	<i>MJ</i>	<i>B</i>	4/11/97	1600	STORAGE	4U2

INDUSTRIAL CORROSION MANAGEMENT, INC.  
1152 Route 10  
Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515

Certified for: NJ, PA, DE, CT, NY (DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

LABORATORY CHRONICLE

DATE SAMPLED: 04/05/97 . PRESERVATIVE: 4 degrees C  
04/02/97\*

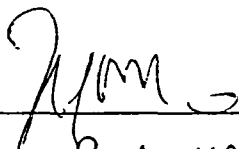
DATE RECEIPT: 04/09/97

GC/MS SEMI-VOLATILES:

AB ID #	DATE EXTRACTED	DATE ANALYZED
260189	04/11/97	04/15/97 04/15/97
260190	04/11/97	04/15/97 04/15/97
260191	04/11/97	04/15/97 04/15/97
260192	04/11/97	04/15/97 04/15/97
260193	04/11/97	04/15/97
260194*	04/11/97	04/15/97

DEPT. SUPERVISOR:

QA REVIEW & APPROVAL:



Paula Helen Blay

INDUSTRIAL CORROSION MANAGEMENT, INC.  
1152 Route 10  
Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515

Certified for: NJ, PA, DE, CT, NY (DOH)  
NJ #14115 NY #11376  
US EPA CLP Lab

LABORATORY CHRONICLE

DATE SAMPLED: 04/05/97 PRESERVATIVE: 4 degrees C  
04/02/97\*

DATE RECEIPT: 04/09/97

8021 VOLATILE:

<u>LAB ID #</u>	<u>DATE ANALYZED</u>
260189	04/16/97 04/17/97
260190	04/15/97 04/17/97 04/17/97
260191	04/17/97 04/17/97 04/17/97
260192	04/15/97 04/17/97
260193	04/16/97 04/17/97
260194*	04/16/97 04/17/97

DEPT. SUPERVISOR:

M. Baron

QA REVIEW & APPROVAL:

Paula Kleur Blay

INDUSTRIAL CORROSION MANAGEMENT, INC.  
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Middletown, NJ 07869  
201-584-0330, FAX: 201-584-0515

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

LABORATORY CHRONICLE

DATE SAMPLED: 04/05/97 PRESERVATIVE: 4 degrees C  
04/02/97\*  
DATE RECEIPT: 04/09/97

METALS:

ID #	DATE ANALYZED METALS	DATE ANALYZED MERCURY
260189	04/14/97	04/14/97
260190	04/14/97	04/14/97
260191	04/14/97	04/14/97
260192	04/14/97	04/14/97
260193	04/14/97	04/14/97
260194*	04/14/97	04/14/97

DEPT. SUPERVISOR:

QA REVIEW & APPROVAL:



INDUSTRIAL CORROSION MANAGEMENT, INC.  
1152 Route 10  
Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515

Certified for: NJ, PA, DE, CT, NY (DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

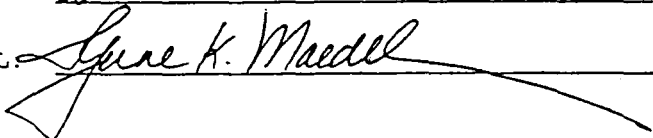
LABORATORY CHRONICLE

DATE SAMPLED: 04/05/97 PRESERVATIVE: 4 degrees C  
04/02/97\*  
DATE RECEIPT: 04/09/97

GENERAL ANALYTICAL:

AB ID #	PARAMETER	DATE ANALYZED
260189	Cyanide, Total	04/14/97
260190	Cyanide, Total	04/14/97
260191	Cyanide, Total	04/14/97
260192	Cyanide, Total	04/14/97
260193	Cyanide, Total	04/14/97
260194*	Cyanide, Total	04/14/97

DEPT. SUPERVISOR: 

QA REVIEW & APPROVAL: 

INDUSTRIAL CORROSION MANAGEMENT, INC.  
1152 Route 10  
Randolph, NJ 07869  
201-584-0330

NJ DEP and PA DER Certified.  
NJ DEP Lab ID# 14116  
US EPA Historic CLP Lab

CONFORMANCE/NONCONFORMANCE SUMMARY CHECKLIST

Lab Numbers: 260189-260194

(GC)-8021  
Volatile Organics: Analyzed ☒ Not Analyzed ☐

All tunes were run in required frequency. Yes ☐ No ☐ N/A ☒

All tune m/z ratios met criteria. Yes ☐ No ☐ N/A ☒

All initial and/or continuing calibrations were run in required frequency. Yes ☒ No ☐

All calibration SPCCs and CCCs met criteria. Yes ☐ No ☐ N/A ☒

Surrogate recoveries met QC criteria. Yes ☒ No ☐

All method blanks met contamination criteria. Yes ☒ No ☐

All samples were analyzed within the required holding times.  
Yes ☒ No ☐

Comments: \* Sample 260194 was analyzed within the holding time,  
but required an additional dilution. This dilution was analyzed 1  
day past the holding time.

Semi-volatile Organics: Analyzed ☒ Not Analyzed ☐

All tunes were run in required frequency. Yes ☒ No ☐ N/A ☐

All tune m/z ratios met criteria. Yes ☒ No ☐ N/A ☐

All initial and/or continuing calibrations were run in required frequency. Yes ☒ No ☐

All calibration SPCCs and CCCs met criteria. Yes ☒ No ☐ N/A ☐

Surrogate recoveries met QC criteria. Yes ☒ No ☐

All method blanks met contamination criteria. Yes ☒ No ☐

All samples were extracted and analyzed within the required holding times. Yes ☒ No ☐

Comments: \_\_\_\_\_

NJ DEP and PA DER Certified.  
NJ DEP Lab ID# 14116  
US EPA Historic CLP Lab

Lab Numbers: 260189-260194

pesticides/PCBs: Analyzed\_\_\_\_ Not Analyzed ✓

All method blanks met contamination criteria. Yes        No       

All samples were extracted and analyzed within the required holding times. Yes \_\_\_\_\_ No \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Metals: Analyzed ✓ Not Analyzed       

All method blanks met contamination criteria. Yes ✓ No     

All samples were analyzed within the required holding times.  
Yes ☒ No ☐

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Petroleum Hydrocarbons: Analyzed\_\_\_\_ Not Analyzed ✓

All samples were extracted and analyzed within the required holding times. Yes \_\_\_\_\_ No \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

NJ DEP and PA DER Certified.  
NJ DEP Lab ID# 14116  
US EPA Historic CLP Lab

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4/28/97  
Date

Semivolatile Organic Compounds by GC/MS  
\*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition  
\*\*Method 8270B

GC/MS Extraction - Sonication Extraction  
\*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition  
\*\*Method 3550A

Halogenated Volatiles by GC-PID and Hall detectors  
\*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition  
\*\*Method 8021A

Antimony  
\*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition  
\*\*Method 3050A/6010A

Arsenic  
\*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition  
\*\*Method 3050A/6010A

Beryllium  
\*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition  
\*\*Method 3050A/6010A

Cadmium  
\*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition  
\*\*Method 3050A/6010A

Chromium  
\*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition  
\*\*Method 3050A/6010A

Copper  
\*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition  
\*\*Method 3050A/6010A

Lead  
\*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition  
\*\*Method 3050A/6010A

Mercury  
\*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition  
\*\*Method 7470A

Nickel  
\*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition  
\*\*Method 3050A/6010A

Selenium  
\*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition  
\*\*Method 3050A/6010A

Silver  
\*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition  
\*\*Method 3050A/6010A

Zinc  
\*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition  
\*\*Method 3050A/6010A

Barium  
\*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition  
\*\*Method 3050A/6010A

Amide (Automated)  
\*Test Methods for Evaluating Solid Wastes, SW846, 3rd edition  
\*\*Method 9012

\* Indicates reference.  
\*\* Indicates method.

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201-584-0330, FAX: 201-584-0515  
APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY (DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

POLYNUCLEAR AROMATIC HYDROCARBON ANALYSIS BY GC/MS

Lab Number: 260189 Data File: >I3553  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-1  
Sample date: 04/05/97 Extracted Date: 04/11/97  
Sampled by: Customer Analysis Date: 04/15/97 Column: 30m SPB-5  
At lab date: 04/09/97 Dilution Factor: 10  
Percent Moisture: 20.82%  
Matrix: Soil Init Sample Wght= 30g Final volume= 10ml

Initial sample weight DWB= 23.754g

Conc. in Sample = (Conc. on Quant Report/Initial Sample Weight DWB)\*Final Volume\*1000

Parameter	Result ug/kg	Method Blank ug/kg	Practical Quantitation Limit ug/kg	Minimum Detection Limit ug/kg
Naphthalene	39000	U	2100	840
Acenaphthylene	22000	U	2100	630
Acenaphthene	11000	U	2100	800
Fluorene	41000	U	2100	720
Phenanthrene	160000	U	2100	380
Anthracene	20000	U	2100	340
Fluoranthene	60000	U	2100	250
Pyrene	140000	U	2100	210
Benzo (a) anthracene	56000	U	2100	210
Chrysene	68000	U	2100	210
Benzo (b) fluoranthene	61000	U	2100	290
Benzo (k) fluoranthene	U	U	2100	290
Benzo (a) pyrene	42000	U	2100	210
Indeno (1,2,3-cd) pyrene	12000	U	2100	450
Dibenz (a,h) anthracene	6200	U	2100	210
Benzo (g,h,i) perylene	16000	U	2100	210

ug/kg = micrograms/kilogram or ppb

Results are in ug/kg (ppb); they are reported on a dry weight basis.

ND: Not Determined.  
IND: Indeterminable.

U: Indicates a compound was analyzed for but not detected at the PQL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

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INDUSTRIAL CORROSION MANAGEMENT, INC.  
1152 Route 10  
Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515  
APRIL 28, 1997

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

COMPLIANCE MONITORING FOR VOLATILE ORGANICS Method 8021

Lab Number: 260189  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-1  
Sample date: 04/05/97  
Sampled by: Customer  
Analysis Date: 04/16/97  
04/17/97  
Column: RTX-502.2-0.53MM  
At lab date: 04/09/97  
Percent Moisture: 20.82%  
Dilution Factor: 50  
Matrix: Soil  
Init Sample wght= 0.1g  
Final volume= 5ml  
Instrument: GC 565

Initial sample weight DWB= 0.07918g

Conc. in Sample = (Conc. on Quant Report/Initial Sample Weight DWB)\*Final Volume

Parameter	Result ug/kg	Method Blank ug/kg	Practical Quantitation Limit ug/kg	Minimum Detection Limit ug/kg
Benzene	U	U	63	25
Ethylbenzene	U	U	63	32
Toluene	94	U	63	25
o-Xylene	140	U	63	51
m+p-Xylene	150	U	63	57
Isopropylbenzene	U	U	63	32
n-Propylbenzene	U	U	63	57
p-Isopropyltoluene	U	U	63	32
1,2,4-Trimethylbenzene	600	U	63	25
1,3,5-Trimethylbenzene	120	U	63	44
n-Butylbenzene	150	U	63	32
sec-Butylbenzene	U	U	63	32
Naphthalene	68000	U	63	32
MTBE	U	U	63	32
t-Butyl-benzene	160	U	63	32

ug/kg = micrograms/kilogram or ppb

U: Indicates a compound was analyzed for but not detected at the MDL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

ND: Not Determined.

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Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515  
APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

INORGANIC LABORATORY ANALYSIS

Lab Number: 260189  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-1  
Sample date: 04/05/97  
Sampled by: Customer  
At lab date: 04/09/97  
Matrix: SOIL  
Percent Moisture: 20.82 %

ICP/FURNACE Initial weight: 2.0 g  
Mercury Initial weight: 0.5 g  
Results in mg/Kg dry weight basis.

ICP/FURNACE Final volume: 100 ml  
Mercury Final volume: 100 ml

Parameter	Sample Result	Method Blank Analysis	Minimum Detection Limit	Dilution Factor	Analysis Date
Antimony	1.89	U	0.631	1	04/14/97
Arsenic	16.0	U	0.253	1	04/14/97
Beryllium	U	U	0.316	1	04/14/97
Cadmium	U	U	0.189	1	04/14/97
Chromium	18.9	U	0.316	1	04/14/97
Copper	98.5	U	0.316	1	04/14/97
Lead	2170	U	0.253	1	04/14/97
Mercury	0.530	U	0.051	1	04/14/97
Nickel	12.6	U	0.316	1	04/14/97
Selenium	2.34	U	0.316	1	04/14/97
Silver	U	U	0.316	1	04/14/97
Thallium	U	U	0.505	1	04/14/97
Zinc	168	U	1.26	1	04/14/97

U = Not Detected

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APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

LABORATORY ANALYSIS

All results are reported in mg/kg (ppm) dry weight basis unless otherwise stated.

Lab Number: 260189  
Client: IMPACT ENVIRONMENTAL  
Sample Source: 97-070  
Sample ID: SP-1  
Sample matrix: SOIL  
Sample date: 04/05/97  
Sampled by: Customer  
At lab date: 04/09/97  
% Moisture: 20.82%

ETER	DILUTION FACTOR	RESULT	METHOD BLANK	MINIMUM DETECTION LIMIT	ANALYSIS DATE
ide, Total	25	139	U	1.26	04/14/97

< = Less than  
> = Greater than  
U= Not detected, NA= Not applicable.

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Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515  
APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

POLYNUCLEAR AROMATIC HYDROCARBON ANALYSIS BY GC/MS

Lab Number: 260190 Data File: >I3554  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-2  
Sample date: 04/05/97 Extracted Date: 04/11/97  
Sampled by: Customer Analysis Date: 04/15/97 Column: 30m SPB-5  
At lab date: 04/09/97 Dilution Factor: 50  
Percent Moisture: 23.5%  
Matrix: Soil Init Sample Wght= 30g Final volume= 50ml  
Initial sample weight DWB= 22.95g

Conc. in Sample = (Conc. on Quant Report/Initial Sample Weight DWB)\*Final Volume\*1000

Parameter	Result ug/kg	Method Blank ug/kg	Practical Quantitation Limit ug/kg	Minimum Detection Limit ug/kg
Naphthalene	470000	U	11000	4400
Acenaphthylene	61000	U	11000	3300
Acenaphthene	55000	U	11000	4100
Fluorene	170000	U	11000	3700
Phenanthrene	770000	U	11000	2000
Anthracene	72000	U	11000	1700
Fluoranthene	200000	U	11000	1300
Pyrene	440000	U	11000	1100
Benzo(a)anthracene	160000	U	11000	1100
Chrysene	200000	U	11000	1100
Benzo(b)fluoranthene	170000	U	11000	1500
Benzo(k)fluoranthene	U	U	11000	1500
Benzo(a)pyrene	110000	U	11000	1100
Indeno(1,2,3-cd)pyrene	33000	U	11000	2400
Dibenz(a,h)anthracene	17000	U	11000	1100
Benzo(g,h,i)perylene	39000	U	11000	1100

ug/kg = micrograms/kilogram or ppb

Results are in ug/kg (ppb); they are reported on a dry weight basis.

ND: Not Determined.  
IND: Indeterminable.

U: Indicates a compound was analyzed for but not detected at the PQL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

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APRIL 21, 1997

Certified for: NJ, PA, DE, CT, NY (DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

COMPLIANCE MONITORING FOR VOLATILE ORGANICS Method 8021

Lab Number: 260190  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-2  
Sample date: 04/05/97  
Sampled by: Customer  
Analysis Date: 04/15/97  
04/17/97  
04/17/97  
Column: RTX-502.2-0.53MM  
At lab date: 04/09/97  
Percent Moisture: 23.5%  
Dilution Factor: 50  
Matrix: Soil  
Init Sample wght= 0.1g  
Final volume= 5ml  
Instrument: GC 565

Initial sample weight DWB= 0.0765g

Conc. in Sample = (Conc. on Quant Report/Initial Sample Weight DWB)\*Final Volume

Parameter	Result ug/kg	Method Blank ug/kg	Practical Quantitation Limit ug/kg	Minimum Detection Limit ug/kg
Benzene	68	U	65	26
Ethylbenzene	320	U	65	33
Toluene	500	U	65	26
o-Xylene	1800	U	65	52
m+p-Xylene	2200	U	65	59
Isopropylbenzene	51J	U	65	33
n-Propylbenzene	380	U	65	59
p-Isopropyltoluene	270	U	65	33
1,2,4-Trimethylbenzene	7900	U	65	26
1,3,5-Trimethylbenzene	1800	U	65	46
n-Butylbenzene	4700	U	65	33
sec-Butylbenzene	U	U	65	33
Naphthalene	270000	U	65	33
MTBE	U	U	65	33
t-Butyl-benzene	3200	U	65	33

ug/kg = micrograms/kilogram or ppb

U: Indicates a compound was analyzed for but not detected at the MDL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

4/21/97

ND: Not Determined.

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201-584-0330, FAX: 201-584-0515  
APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

INORGANIC LABORATORY ANALYSIS

Lab Number: 260190  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-2  
Sample date: 04/05/97  
Sampled by: Customer  
Lab date: 04/09/97  
Matrix: SOIL  
Percent Moisture: 23.5 %

ICP/FURNACE Initial weight: 2.0 g ICP/FURNACE Final volume: 100 ml  
Mercury Initial weight: 0.5 g Mercury Final volume: 100 ml  
Results in mg/Kg dry weight basis.

Parameter	Sample Result	Method Blank Analysis	Minimum Detection Limit	Dilution Factor	Analysis Date
Antimony	2.42	U	0.654	1	04/14/97
Arsenic	18.4	U	0.261	1	04/14/97
Beryllium	U	U	0.327	1	04/14/97
Cadmium	U	U	0.196	1	04/14/97
Chromium	20.4	U	0.327	1	04/14/97
Copper	152	U	0.327	1	04/14/97
Lead	2010	U	0.261	1	04/14/97
Mercury	1.02	U	0.052	1	04/14/97
Nickel	13.5	U	0.327	1	04/14/97
Selenium	2.35	U	0.327	1	04/14/97
Silver	0.458	U	0.327	1	04/14/97
Thallium	U	U	0.654	1	04/14/97
Zinc	127	U	1.31	1	04/14/97

U = Not Detected

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APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

LABORATORY ANALYSIS

All results are reported in mg/kg (ppm) dry weight basis unless otherwise stated.

Lab Number: 260190  
Client: IMPACT ENVIRONMENTAL  
Sample Source: 97-070  
Sample ID: SP-2  
Sample matrix: SOIL  
Sample date: 04/05/97  
Sampled by: Customer  
At lab date: 04/09/97  
% Moisture: 23.5%

PARAMETER	DILUTION FACTOR	RESULT	METHOD BLANK	MINIMUM DETECTION LIMIT	ANALYSIS DATE
Amide, Total	25	157	U	1.31	04/14/97

< = Less than  
> = Greater than  
U= Not detected, NA= Not applicable.

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Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515  
APRIL 28, 1997

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

POLYNUCLEAR AROMATIC HYDROCARBON ANALYSIS BY GC/MS

Lab Number: 260191 Data File: >I3555  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-3  
Sample date: 04/05/97 Extracted Date: 04/11/97  
Sampled by: Customer Analysis Date: 04/15/97 Column: 30m SPB-5  
At lab date: 04/09/97 04/15/97 Dilution Factor: 10  
Percent Moisture: 21.57%  
Matrix: Soil Init Sample Wght= 30g Final volume= 10ml  
Initial sample weight DWB= 23.529g

Conc. in Sample = (Conc. on Quant Report/Initial Sample Weight DWB)\*Final Volume\*1000

Parameter	Result ug/kg	Method Blank ug/kg	Practical Quantitation Limit ug/kg	Minimum Detection Limit ug/kg
Naphthalene	200000	U	2100	850
Acenaphthylene	24000	U	2100	640
Acenaphthene	21000	U	2100	810
Fluorene	68000	U	2100	720
Phenanthrene	320000	U	2100	380
Anthracene	36000	U	2100	340
Fluoranthene	61000	U	2100	260
Pyrene	200000	U	2100	210
Benzo(a)anthracene	67000	U	2100	210
Chrysene	88000	U	2100	210
Benzo(b)fluoranthene	68000	U	2100	300
Benzo(k)fluoranthene	U	U	2100	300
Benzo(a)pyrene	50000	U	2100	210
Indeno(1,2,3-cd)pyrene	17000	U	2100	470
Dibenz(a,h)anthracene	8900	U	2100	210
Benzo(g,h,i)perylene	19000	U	2100	210

ug/kg = micrograms/kilogram or ppb

Results are in ug/kg (ppb); they are reported on a dry weight basis.

ND: Not Determined.  
IND: Indeterminable.

U: Indicates a compound was analyzed for but not detected at the PQL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

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Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515  
APRIL 28, 1997

Certified for: NJ, PA, DE, CT, NY (DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

COMPLIANCE MONITORING FOR VOLATILE ORGANICS Method 8021

Lab Number: 260191  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-3  
Sample date: 04/05/97  
Sampled by: Customer  
Analysis Date: 04/17/97  
Column: RTX-502.2-0.53MM  
04/17/97  
04/17/97  
At lab date: 04/09/97  
Percent Moisture: 21.57%  
Dilution Factor: 50  
Matrix: Soil  
Init Sample wght= 0.1g  
Final volume= 5ml  
Instrument: GC 565

Initial sample weight DWB= 0.07843g

Conc. in Sample = (Conc. on Quant Report/Initial Sample Weight DWB)\*Final Volume

Parameter	Result ug/kg	Method Blank ug/kg	Practical Quantitation Limit ug/kg	Minimum Detection Limit ug/kg
Benzene	55J	U	64	26
Ethylbenzene	380	U	64	32
Toluene	200	U	64	26
o-Xylene	1400	U	64	51
m+p-Xylene	1700	U	64	57
Isopropylbenzene	58J	U	64	32
n-Propylbenzene	210	U	64	57
p-Isopropyltoluene	120	U	64	32
1,2,4-Trimethylbenzene	6000	U	64	26
1,3,5-Trimethylbenzene	1400	U	64	45
n-Butylbenzene	1700	U	64	32
sec-Butylbenzene	U	U	64	32
Naphthalene	280000	U	64	32
MTBE	U	U	64	32
t-Butyl-benzene	1800	U	64	32

ug/kg = micrograms/kilogram or ppb

U: Indicates a compound was analyzed for but not detected at the MDL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

ND: Not Determined.

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201-584-0330, FAX: 201-584-0515  
APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

INORGANIC LABORATORY ANALYSIS

Lab Number: 260191  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-3  
Sample date: 04/05/97  
Sampled by: Customer  
At lab date: 04/09/97  
Matrix: SOIL  
Percent Moisture: 21.57 %

ICP/FURNACE Initial weight: 2.0 g ICP/FURNACE Final volume: 100 ml  
Mercury Initial weight: 0.5 g Mercury Final volume: 100 ml  
Results in mg/Kg dry weight basis.

Parameter	Sample Result	Method Blank Analysis	Minimum Detection Limit	Dilution Factor	Analysis Date
Antimony	0.893	U	0.638	1	04/14/97
Arsenic	11.2	U	0.255	1	04/14/97
Beryllium	U	U	0.319	1	04/14/97
Cadmium	U	U	0.191	1	04/14/97
Chromium	13.3	U	0.319	1	04/14/97
Copper	117	U	0.319	1	04/14/97
Lead	427	U	0.255	1	04/14/97
Mercury	0.995	U	0.051	1	04/14/97
Nickel	14.8	U	0.319	1	04/14/97
Selenium	1.47	U	0.319	1	04/14/97
Silver	U	U	0.319	1	04/14/97
Thallium	U	U	0.510	1	04/14/97
Zinc	91.8	U	1.28	1	04/14/97

U = Not Detected

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APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

LABORATORY ANALYSIS

All results are reported in mg/kg (ppm) dry weight basis unless otherwise stated.

Lab Number: 260191  
Client: IMPACT ENVIRONMENTAL  
Sample Source: 97-070  
Sample ID: SP-3  
Sample matrix: SOIL  
Sample date: 04/05/97  
Sampled by: Customer  
At lab date: 04/09/97  
% Moisture: 21.57%

AMETER	DILUTION FACTOR	RESULT	METHOD BLANK	MINIMUM DETECTION LIMIT	ANALYSIS DATE
ide, Total	50	137	U	1.28	04/14/97

< = Less than  
> = Greater than  
U= Not detected, NA= Not applicable.

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201-584-0330, FAX: 201-584-0515  
APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY (DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

POLYNUCLEAR AROMATIC HYDROCARBON ANALYSIS BY GC/MS

Lab Number: 260192 Data File: >I3556  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-4  
Sample date: 04/05/97 Extracted Date: 04/11/97  
Sampled by: Customer Analysis Date: 04/15/97 Column: 30m SPB-5  
At lab date: 04/09/97 04/15/97 Dilution Factor: 50  
Percent Moisture: 21.78%  
Matrix: Soil Init Sample Wght= 30g Final volume= 50ml  
Initial sample weight DWB= 23.466g

Conc. in Sample = (Conc. on Quant Report/Initial Sample Weight DWB)\*Final Volume\*1000

Parameter	Result ug/kg	Method Blank ug/kg	Practical Quantitation Limit ug/kg	Minimum Detection Limit ug/kg
Naphthalene	230000	U	11000	4300
Acenaphthylene	69000	U	11000	3200
Acenaphthene	59000	U	11000	4000
Fluorene	190000	U	11000	3600
Phenanthrene	640000	U	11000	1900
Anthracene	93000	U	11000	1700
Fluoranthene	170000	U	11000	1300
Pyrene	410000	U	11000	1100
Benzo(a)anthracene	140000	U	11000	1100
Chrysene	180000	U	11000	1100
Benzo(b)fluoranthene	140000	U	11000	1500
Benzo(k)fluoranthene	U	U	11000	1500
Benzo(a)pyrene	110000	U	11000	1100
Indeno(1,2,3-cd)pyrene	32000	U	11000	2300
Dibenz(a,h)anthracene	15000	U	11000	1100
Benzo(g,h,i)perylene	34000	U	11000	1100

ug/kg = micrograms/kilogram or ppb

Results are in ug/kg (ppb); they are reported on a dry weight basis.

ND: Not Determined.  
IND: Indeterminable.

U: Indicates a compound was analyzed for but not detected at the PQL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

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1152 Route 10  
Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515  
APRIL 21, 1997

Certified for: NJ, PA, DE, CT, NY (DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

COMPLIANCE MONITORING FOR VOLATILE ORGANICS Method 8021

Lab Number: 260192  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-4  
Sample date: 04/05/97  
Sampled by: Customer  
Analysis Date: 04/15/97  
Column: RTX-502.2-0.53MM  
04/17/97  
At lab date: 04/09/97  
Percent Moisture: 21.78%  
Dilution Factor: 100  
Matrix: Soil  
Init Sample wght= 0.05g  
Final volume= 5ml  
Instrument: GC 565

Initial sample weight DWB= 0.03911g

Conc. in Sample = (Conc. on Quant Report/Initial Sample Weight DWB)\*Final Volume

Parameter	Result ug/kg	Method Blank ug/kg	Practical Quantitation Limit ug/kg	Minimum Detection Limit ug/kg
Benzene	140	U	130	51
Ethylbenzene	390	U	130	64
Toluene	320	U	130	51
o-Xylene	1500	U	130	100
m+p-Xylene	1700	U	130	120
Isopropylbenzene	U	U	130	64
n-Propylbenzene	210	U	130	120
p-Isopropyltoluene	110J	U	130	64
1,2,4-Trimethylbenzene	6100	U	130	51
1,3,5-Trimethylbenzene	1500	U	130	89
n-Butylbenzene	2600	U	130	64
sec-Butylbenzene	U	U	130	64
Naphthalene	380000	U	130	64
MTBE	U	U	130	64
t-Butyl-benzene	2600	U	130	64

ug/kg = micrograms/kilogram or ppb

U: Indicates a compound was analyzed for but not detected at the MDL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

ms 4/2/97

ND: Not Determined.

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INDUSTRIAL CORROSION MANAGEMENT, INC.  
52 Route 10  
Lindolph, NJ 07869  
Tel: 201-584-0330, FAX: 201-584-0515  
APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

INORGANIC LABORATORY ANALYSIS

Lab Number: 260192  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-4  
Sample date: 04/05/97  
Sampled by: Customer  
At lab date: 04/09/97  
Matrix: SOIL  
Percent Moisture: 21.78 %

ICP/FURNACE Initial weight: 2.0 g ICP/FURNACE Final volume: 100 ml  
Mercury Initial weight: 0.5 g Mercury Final volume: 100 ml  
Results in mg/Kg dry weight basis.

Parameter	Sample Result	Method Blank Analysis	Minimum Detection Limit	Dilution Factor	Analysis Date
Antimony	1.15	U	0.639	1	04/14/97
Arsenic	14.6	U	0.256	1	04/14/97
Beryllium	U	U	0.320	1	04/14/97
Cadmium	0.192	U	0.192	1	04/14/97
Chromium	13.9	U	0.320	1	04/14/97
Copper	114	U	0.320	1	04/14/97
Lead	1070	U	0.256	1	04/14/97
Mercury	1.12	U	0.051	1	04/14/97
Nickel	18.0	U	0.320	1	04/14/97
Selenium	1.79	U	0.320	1	04/14/97
Silver	0.575	U	0.320	1	04/14/97
Thallium	U	U	0.511	1	04/14/97
Zinc	95.9	U	1.28	1	04/14/97

U = Not Detected

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APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

LABORATORY ANALYSIS

All results are reported in mg/kg (ppm) dry weight basis unless otherwise stated.

Lab Number: 260192  
Client: IMPACT ENVIRONMENTAL  
Sample Source: 97-070  
Sample ID: SP-4  
Sample matrix: SOIL  
Sample date: 04/05/97  
Sampled by: Customer  
At lab date: 04/09/97  
% Moisture: 21.78%

METER	DILUTION FACTOR	RESULT	METHOD BLANK	MINIMUM DETECTION LIMIT	ANALYSIS DATE
ide, Total	50	148	U	1.28	04/14/97

< = Less than  
> = Greater than  
U= Not detected, NA= Not applicable.

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Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515  
APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY (DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

POLYNUCLEAR AROMATIC HYDROCARBON ANALYSIS BY GC/MS

Lab Number: 260193 Data File: >I3567  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-5  
Sample date: 04/05/97 Extracted Date: 04/11/97  
Sampled by: Customer Analysis Date: 04/15/97 Column: 30m SPB-5  
At lab date: 04/09/97 Dilution Factor: 5  
Percent Moisture: 23.11%  
Matrix: Soil Init Sample Wght= 30g Final volume= 5ml

Initial sample weight DWB= 23.067g

Conc. in Sample = (Conc. on Quant Report/Initial Sample Weight DWB)\*Final Volume\*1000

Parameter	Result ug/kg	Method Blank ug/kg	Practical Quantitation Limit ug/kg	Minimum Detection Limit ug/kg
Naphthalene	12000	U	1100	430
Acenaphthylene	3300	U	1100	330
Acenaphthene	10000	U	1100	410
Fluorene	7300	U	1100	370
Phenanthrene	18000	U	1100	200
Anthracene	5900	U	1100	170
Fluoranthene	9400	U	1100	130
Pyrene	18000	U	1100	110
Benzo(a)anthracene	6700	U	1100	110
Chrysene	6800	U	1100	110
Benzo(b)fluoranthene	4700	U	1100	150
Benzo(k)fluoranthene	U	U	1100	150
Benzo(a)pyrene	7300	U	1100	110
Indeno(1,2,3-cd)pyrene	2000	U	1100	240
Dibenz(a,h)anthracene	910J	U	1100	110
Benzo(g,h,i)perylene	2100	U	1100	110

ug/kg = micrograms/kilogram or ppb  
Results are in ug/kg (ppb); they are reported on a dry weight basis.

ND: Not Determined.  
IND: Indeterminable.

U: Indicates a compound was analyzed for but not detected at the PQL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

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INDUSTRIAL CORROSION MANAGEMENT, INC.  
1152 Route 10  
Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515  
APRIL 21, 1997

Certified for: NJ, PA, DE, CT, NY (DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

COMPLIANCE MONITORING FOR VOLATILE ORGANICS Method 8021

Lab Number: 260193  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-5  
Sample date: 04/05/97  
Sampled by: Customer  
Analysis Date: 04/16/97  
Column: RTX-502.2-0.53MM  
04/17/97  
At lab date: 04/09/97  
Percent Moisture: 23.11%  
Dilution Factor: 250  
Matrix: Soil  
Init Sample wght= 0.02g  
Final volume= 5ml  
Instrument: GC 565

Initial sample weight DWB= 0.015378g

Conc. in Sample = (Conc. on Quant Report/Initial Sample Weight DWB)\*Final Volume

Parameter	Result ug/kg	Method Blank ug/kg	Practical Quantitation Limit ug/kg	Minimum Detection Limit ug/kg
Benzene	U	U	330	130
Ethylbenzene	U	U	330	160
Toluene	U	U	330	130
o-Xylene	330	U	330	260
m+p-Xylene	U	U	330	290
Isopropylbenzene	U	U	330	160
n-Propylbenzene	U	U	330	290
p-Isopropyltoluene	U	U	330	160
1,2,4-Trimethylbenzene	3700	U	330	130
1,3,5-Trimethylbenzene	540	U	330	230
n-Butylbenzene	1600	U	330	160
sec-Butylbenzene	U	U	330	160
Naphthalene	85000	U	330	160
MTBE	U	U	330	160
t-Butyl-benzene	860	U	330	160

ug/kg = micrograms/kilogram or ppb

U: Indicates a compound was analyzed for but not detected at the MDL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

Wm/2/97

ND: Not Determined.

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Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515  
APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

INORGANIC LABORATORY ANALYSIS

Lab Number: 260193  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-5  
Sample date: 04/05/97  
Sampled by: Customer  
At lab date: 04/09/97  
Matrix: SOIL  
Percent Moisture: 23.11 %

ICP/FURNACE Initial weight: 2.0 g      ICP/FURNACE Final volume: 100 ml  
Mercury Initial weight: 0.5 g      Mercury Final volume: 100 ml  
Results in mg/Kg dry weight basis.

Parameter	Sample Result	Method Blank Analysis	Minimum Detection Limit	Dilution Factor	Analysis Date
Antimony	U	U	0.650	1	04/14/97
Arsenic	8.91	U	0.260	1	04/14/97
Beryllium	0.520	U	0.325	1	04/14/97
Cadmium	U	U	0.195	1	04/14/97
Chromium	14.5	U	0.325	1	04/14/97
Copper	76.7	U	0.325	1	04/14/97
Lead	832	U	0.260	1	04/14/97
Mercury	20.7	U	0.052	10	04/14/97
Nickel	15.2	U	0.325	1	04/14/97
Selenium	1.88	U	0.325	1	04/14/97
Silver	U	U	0.325	1	04/14/97
Thallium	U	U	0.520	1	04/14/97
Zinc	159	U	1.30	1	04/14/97

U = Not Detected

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INDUSTRIAL CORROSION MANAGEMENT, INC.  
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Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515  
APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

LABORATORY ANALYSIS

All results are reported in mg/kg (ppm) dry weight basis unless otherwise stated.

Lab Number: 260193  
Client: IMPACT ENVIRONMENTAL  
Sample Source: 97-070  
Sample ID: SP-5  
Sample matrix: SOIL  
Sample date: 04/05/97  
Sampled by: Customer  
At lab date: 04/09/97  
% Moisture: 23.11%

METER	DILUTION FACTOR	RESULT	METHOD BLANK	MINIMUM DETECTION LIMIT	ANALYSIS DATE
Lead, Total	1	U	U	1.30	04/14/97

< = Less than  
> = Greater than  
U= Not detected, NA= Not applicable.

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Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515  
APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY (DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

POLYNUCLEAR AROMATIC HYDROCARBON ANALYSIS BY GC/MS

Lab Number: 260194  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-6  
Sample date: 04/02/97  
Sampled by: Customer  
At lab date: 04/09/97

Data File: >I3562

Extracted Date: 04/11/97  
Analysis Date: 04/15/97  
Column: 30m SPB-5  
Dilution Factor: 10  
Percent Moisture: 22.56%  
Final volume= 10ml

Matrix: Soil

Init Sample Wght= 30g

Initial sample weight DWB= 23.232g

Conc. in Sample = (Conc. on Quant Report/Initial Sample Weight DWB)\*Final Volume\*1000

Parameter	Result ug/kg	Method Blank ug/kg	Practical Quantitation Limit ug/kg	Minimum Detection Limit ug/kg
Naphthalene	2800	U	2200	860
Acenaphthylene	2200	U	2200	650
Acenaphthene	2400	U	2200	820
Fluorene	5500	U	2200	730
Phenanthrene	14000	U	2200	390
Anthracene	3400	U	2200	340
Fluoranthene	9500	U	2200	260
Pyrene	16000	U	2200	220
Benzo (a) anthracene	4900	U	2200	220
Chrysene	5600	U	2200	220
Benzo (b) fluoranthene	3100	U	2200	300
Benzo (k) fluoranthene	U	U	2200	300
Benzo (a) pyrene	4000	U	2200	220
Indeno (1,2,3-cd) pyrene	U	U	2200	470
Dibenz (a,h) anthracene	U	U	2200	220
Benzo (g,h,i) perylene	U	U	2200	220

ug/kg = micrograms/kilogram or ppb

Results are in ug/kg (ppb); they are reported on a dry weight basis.

ND: Not Determined.

IND: Indeterminable.

U: Indicates a compound was analyzed for but not detected at the PQL.

J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.

B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

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INDUSTRIAL CORROSION MANAGEMENT, INC.  
1152 Route 10  
Randolph, NJ 07869  
201-584-0330, FAX: 201-584-0515  
APRIL 28, 1997

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

COMPLIANCE MONITORING FOR VOLATILE ORGANICS Method 8021

Lab Number: 260194  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-6  
Sample date: 04/02/97  
Sampled by: Customer  
Analysis Date: 04/16/97  
Column: RTX-502.2-0.53MM  
04/17/97  
At lab date: 04/09/97  
Percent Moisture: 22.56%  
Dilution Factor: 25  
Matrix: Soil  
Init Sample wght= 0.2g  
Final volume= 5ml  
Instrument: GC 565

Initial sample weight DWB= 0.15488g

Conc. in Sample = (Conc. on Quant Report/Initial Sample Weight DWB)\*Final Volume

Parameter	Result ug/kg	Method Blank ug/kg	Practical Quantitation Limit ug/kg	Minimum Detection Limit ug/kg
Benzene	91	U	32	13
Ethylbenzene	290	U	32	16
Toluene	96	U	32	13
o-Xylene	86	U	32	26
m+p-Xylene	79	U	32	29
Isopropylbenzene	35	U	32	16
n-Propylbenzene	U	U	32	29
p-Isopropyltoluene	70	U	32	16
1,2,4-Trimethylbenzene	140	U	32	13
1,3,5-Trimethylbenzene	530	U	32	23
n-Butylbenzene	610	U	32	16
sec-Butylbenzene	U	U	32	16
Naphthalene	29000	U	32	16
MTBE	U	U	32	16
t-Butyl-benzene	52	U	32	16

ug/kg = micrograms/kilogram or ppb

U: Indicates a compound was analyzed for but not detected at the MDL.  
J: Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit but greater than zero.  
B: Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.

ND: Not Determined.

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INDUSTRIAL CORROSION MANAGEMENT, INC.  
1152 Route 10  
Andolph, NJ 07869  
01-584-0330, FAX: 201-584-0515  
APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

INORGANIC LABORATORY ANALYSIS

Lab Number: 260194  
Client: IMPACT ENVIRONMENTAL  
Sample source: 97-070  
Sample ID: SP-6  
Sample date: 04/02/97  
Sampled by: Customer  
At lab date: 04/09/97  
Matrix: SOIL  
Percent Moisture: 22.56 %

ICP/FURNACE Initial weight: 2.0 g ICP/FURNACE Final volume: 100 ml  
Mercury Initial weight: 0.5 g Mercury Final volume: 100 ml  
Results in mg/Kg dry weight basis.

Parameter	Sample Result	Method Blank Analysis	Minimum Detection Limit	Dilution Factor	Analysis Date
Antimony	8.72	U	0.646	1	04/14/97
Arsenic	10.0	U	0.258	1	04/14/97
Beryllium	0.323	U	0.323	1	04/14/97
Cadmium	U	U	0.194	1	04/14/97
Chromium	15.4	U	0.323	1	04/14/97
Copper	77.5	U	0.323	1	04/14/97
Lead	404	U	0.258	1	04/14/97
Mercury	0.930	U	0.052	1	04/14/97
Nickel	11.2	U	0.323	1	04/14/97
Selenium	0.968	U	0.323	1	04/14/97
Silver	1.55	U	0.323	1	04/14/97
Thallium	U	U	0.517	1	04/14/97
Zinc	266	U	1.29	1	04/14/97

U = Not Detected

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201-584-0330, FAX: 201-584-0515  
APRIL 16, 1997

Certified for: NJ, PA, DE, CT, NY(DOH)  
NJ #14116 NY #11376  
US EPA CLP Lab

LABORATORY ANALYSIS

All results are reported in mg/kg (ppm) dry weight basis unless otherwise stated.

Lab Number: 260194  
Client: IMPACT ENVIRONMENTAL  
Sample Source: 97-070  
Sample ID: SP-6  
Sample matrix: SOIL  
Sample date: 04/02/97  
Sampled by: Customer  
At lab date: 04/09/97  
% Moisture: 22.56%

METER	DILUTION FACTOR	RESULT	METHOD BLANK	MINIMUM DETECTION LIMIT	ANALYSIS DATE
Acid, Total	2	15.2	U	1.29	04/14/97

< = Less than

> = Greater than

U= Not detected, NA= Not applicable.

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Richard Levine, President

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**Analytical Data Reports  
SP 10, 11, 12, 13, 14 and 15**



ICM Laboratories  
Industrial Corrosion Management, Inc.  
1152 Route 10  
Randolph, NJ 07869  
Phone: 201-584-0330 FAX: 201-584-0515

MAY 19, 1997  
11:12:44

Client:  
IMPACT ENVIRONMENTAL  
Source:  
Brooklyn

ANALYTICAL DATA SUMMARY REPORT

Client ID	See Notes	See Notes	See Notes	See Notes	See Notes	See Notes
ICM Sample Number	262798	262799	262800	262801	262802	262803
Sampling Date	05/07/97	05/07/97	05/07/97	05/07/97	05/07/97	05/07/97
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
VOLATILE PARAMETERS (METHOD 624/8240)						
Chloromethane	5.9 U	6.3 U	NA	NA	NA	NA
Bromomethane	5.9 U	6.3 U	NA	NA	NA	NA
Vinyl chloride	5.9 U	6.3 U	NA	NA	NA	NA
Chloroethane	5.9 U	6.3 U	NA	NA	NA	NA
Acrolein	120 U	130 U	NA	NA	NA	NA
Acrylonitrile	120 U	130 U	NA	NA	NA	NA
Methylene chloride	5.4 U	6.7 U	NA	NA	NA	NA
Trichlorofluoromethane	5.9 U	6.3 U	NA	NA	NA	NA
1,1-Dichloroethene	5.9 U	6.3 U	NA	NA	NA	NA
1,1-Dichloroethane	5.9 U	6.3 U	NA	NA	NA	NA
trans-1,2-Dichloroethene	5.9 U	6.3 U	NA	NA	NA	NA
Chloroform	5.9 U	6.3 U	NA	NA	NA	NA
1,2-Dichloroethane	5.9 U	6.3 U	NA	NA	NA	NA
1,1,1-Trichloroethane	5.9 U	6.3 U	NA	NA	NA	NA
Carbon tetrachloride	5.9 U	6.3 U	NA	NA	NA	NA
Bromodichloromethane	5.9 U	6.3 U	NA	NA	NA	NA
1,2-Dichloropropane	5.9 U	6.3 U	NA	NA	NA	NA
cis-1,3-Dichloropropene	5.9 U	6.3 U	NA	NA	NA	NA
Trichloroethene	5.9 U	6.3 U	NA	NA	NA	NA
Dibromochloromethane	5.9 U	6.3 U	NA	NA	NA	NA
1,1,2-Trichloroethane	5.9 U	6.3 U	NA	NA	NA	NA
Benzene	5.9 U	6.3 U	NA	NA	NA	NA
trans-1,3-Dichloropropene	5.9 U	6.3 U	NA	NA	NA	NA
2-Chloroethyl vinyl ether	5.9 U	6.3 U	NA	NA	NA	NA
Bromoform	5.9 U	6.3 U	NA	NA	NA	NA
Tetrachloroethene	5.9 U	6.3 U	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	5.9 U	6.3 U	NA	NA	NA	NA
Toluene	5.9 U	6.3 U	NA	NA	NA	NA
Chlorobenzene	5.9 U	6.3 U	NA	NA	NA	NA
Ethylbenzene	5.9 U	6.3 U	NA	NA	NA	NA
p&m-Xylene	5.9 U	6.3 U	NA	NA	NA	NA
o-Xylene	5.9 U	6.3 U	NA	NA	NA	NA
total Xylenes	5.9 U	6.3 U	NA	NA	NA	NA
Total Non-Target Compounds	80	154	NA	NA	NA	NA

P.02

ICM LABORATORIES  
10:20  
MON  
MAY-19-97

ICM Laboratories  
Industrial Corrosion Management, Inc.  
1152 Route 10  
Randolph, NJ 07869  
Phone: 201-584-0330 FAX: 201-584-0515

MAY 19, 1997  
11:12:52

Client:  
IMPACT ENVIRONMENTAL  
Source:  
Brooklyn

ANALYTICAL DATA SUMMARY REPORT

Client ID	See Notes	See Notes	See Notes	See Notes	See Notes	See Notes
ICM Sample Number	262798	262799	262800	262801	262802	262803
Sampling Date	05/07/97	05/07/97	05/07/97	05/07/97	05/07/97	05/07/97
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILE PARAMETERS (ACID FRACTION)						
Phenol	390 U	420 U	NA	NA	NA	NA
2-Chlorophenol	390 U	420 U	NA	NA	NA	NA
2-Nitrophenol	390 U	420 U	NA	NA	NA	NA
2,4-Dimethylphenol	390 U	420 U	NA	NA	NA	NA
2,4-Dichlorophenol	390 U	420 U	NA	NA	NA	NA
4-Chloro-3-methylphenol	390 U	420 U	NA	NA	NA	NA
2,4,6-Trichlorophenol	390 U	420 U	NA	NA	NA	NA
2,4-Dinitrophenol	390 U	420 U	NA	NA	NA	NA
4-Nitrophenol	390 U	420 U	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	390 U	420 U	NA	NA	NA	NA
Pentachlorophenol	390 U	420 U	NA	NA	NA	NA
Total Non-Target Compounds	10420	11620	NA	NA	NA	NA



MAY 19, 1997  
11:12:57

Client:  
IMPACT ENVIRONMENTAL  
Source:  
Brooklyn

ANALYTICAL DATA SUMMARY REPORT

Client ID	See Notes	See Notes	See Notes	See Notes	See Notes	See Notes
ICM Sample Number	262798	262799	262800	262801	262802	262803
Sampling Date	05/07/97	05/07/97	05/07/97	05/07/97	05/07/97	05/07/97
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILE PARAMETERS (BASE/NEUTRAL)						
N-Nitrosodimethylamine	200 U	210 U	NA	NA	NA	NA
bis(2-Chloroethyl)ether	200 U	210 U	NA	NA	NA	NA
1,3-Dichlorobenzene	200 U	210 U	NA	NA	NA	NA
1,4-Dichlorobenzene	200 U	210 U	NA	NA	NA	NA
1,2-Dichlorobenzene	200 U	210 U	NA	NA	NA	NA
bis(2-Chloroisopropyl)ether	200 U	210 U	NA	NA	NA	NA
N-Nitroso-di-n-propylamine	200 U	210 U	NA	NA	NA	NA
Hexachloroethane	200 U	210 U	NA	NA	NA	NA
Nitrobenzene	200 U	210 U	NA	NA	NA	NA
Isophorone	200 U	210 U	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	200 U	210 U	NA	NA	NA	NA
1,2,4-Trichlorobenzene	200 U	210 U	NA	NA	NA	NA
Naphthalene	1300	120 J	300000	450000	NA	NA
Hexachlorobutadiene	200 U	210 U	NA	NA	NA	NA
Hexachlorocyclopentadiene	200 U	210 U	NA	NA	NA	NA
2-Chloronaphthalene	200 U	210 U	NA	NA	NA	NA
Dimethyl phthalate	200 U	210 U	NA	NA	NA	NA
Acenaphthylene	270	72 J	7600	12000	NA	NA
2,6-Dinitrotoluene	200 U	210 U	NA	NA	NA	NA
Acenaphthene	2800	230	120000	170000	NA	NA
2,4-Dinitrotoluene	200 U	210 U	NA	NA	NA	NA
Diethyl phthalate	200 U	210 U	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	200 U	210 U	NA	NA	NA	NA
Fluorene	3300	210 J	80000	110000	NA	NA
N-Nitrosodiphenylamine	200 U	210 U	NA	NA	NA	NA
1,2-Diphenylhydrazine (Azobenz)	200 U	210 U	NA	NA	NA	NA
4-Bromophenyl phenyl ether	200 U	210 U	NA	NA	NA	NA
Hexachlorobenzene	200 U	210 U	NA	NA	NA	NA
Phenanthrene	6300	2100	190000	290000	NA	NA
Anthracene	6300	510	54000	82000	NA	NA
Di-n-butylphthalate	200 U	210 U	NA	NA	NA	NA
Fluoranthene	23000	3100	78000	150000	NA	NA
Benzidine	200 U	210 U	NA	NA	NA	NA
Pyrene	27000	3500	140000	220000	NA	NA
Butyl benzylphthalate	200 U	210 U	NA	NA	NA	NA
3,3'-Dichlorobenzidine	200 U	210 U	NA	NA	NA	NA
Benzo(a)anthracene	10000	1800	39000	78000	NA	NA
Chrysene	9600	1700	38000	80000	NA	NA
bis(2-Ethylhexyl)phthalate	200 U	210 U	NA	NA	NA	NA
Di-n-octylphthalate	200 U	210 U	NA	NA	NA	NA
Benzo(b)fluoranthene	16000	2600	42000	97000	NA	NA
Benzo(k)fluoranthene	200 U	210 U	5100 U	5300 U	NA	NA
Benzo(a)pyrene	10000	1600	31000	69000	NA	NA
Indeno(1,2,3-cd)pyrene	3900	550	9200	22000	NA	NA

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ICM Laboratories  
Industrial Corrosion Management, Inc.  
1152 Route 10  
Randolph, NJ 07869  
Phone: 201-584-0330 FAX: 201-584-0515

MAY 19, 1997  
11:13:00

Client:  
IMPACT ENVIRONMENTAL  
Source:  
Brooklyn

ANALYTICAL DATA SUMMARY REPORT

Client ID	See Notes	See Notes	See Notes	See Notes	See Notes	See Notes
ICM Sample Number	262798	262799	262800	262801	262802	262803
Sampling Date	05/07/97	05/07/97	05/07/97	05/07/97	05/07/97	05/07/97
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILE PARAMETERS (BASE/NEUTRAL) --- CONTINUED ---						
Dibenz(a,h)anthracene	1700	230	5100 J	12000	NA	NA
Benzo(g,h,i)perylene	4300	590	9500	25000	NA	NA
Total Non-Target Compounds	10420	11620	NA	NA	NA	NA

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ICM Laboratories  
Industrial Corrosion Management, Inc.  
1152 Route 10  
Randolph, NJ 07869  
Phone: 201-584-0330 FAX: 201-584-0515

MAY 19, 1997  
11:13:02

Client:  
IMPACT ENVIRONMENTAL  
Source:  
Brooklyn

ANALYTICAL DATA SUMMARY REPORT

Client ID	See Notes	See Notes	See Notes	See Notes	See Notes	See Notes
ICM Sample Number	262798	262799	262800	262801	262802	262803
Sampling Date	05/07/97	05/07/97	05/07/97	05/07/97	05/07/97	05/07/97
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG

GC Method 8021 Parameters

Benzene	NA	NA	240 U	250 U	0.56 U	0.53 U
Ethylbenzene	NA	NA	8000	9300	0.7 U	0.67 U
Toluene	NA	NA	240 U	250 U	1.3 J	0.53 U
o-Xylene	NA	NA	4700	5700	1.1 U	1.1 U
m+p-Xylene	NA	NA	4800	6100	1.3 U	1.2 U
Isopropylbenzene	NA	NA	2400	2600	0.7 U	0.67 U
n-Propylbenzene	NA	NA	2000	2200	1.3 U	1.2 U
p-Isopropyltoluene	NA	NA	2600	3500	0.7 U	0.67 U
1,2,4-Trimethylbenzene	NA	NA	18000	17000	0.56 U	0.53 U
1,3,5-Trimethylbenzene	NA	NA	11000	15000	0.98 U	0.93 U
n-Butylbenzene	NA	NA	70000	78000	0.7 U	0.67 U
sec-Butylbenzene	NA	NA	310 U	320 U	0.7 U	0.67 U
Naphthalene	NA	NA	180000	270000	1.9 U	0.67 U
MTBE	NA	NA	310 U	320 U	0.7 U	0.67 U
t-Butyl-benzene	NA	NA	7300	9200	0.7 U	0.67 U

ICM Laboratories  
Industrial Corrosion Management, Inc.  
1152 Route 10  
Randolph, NJ 07869  
Phone: 201-584-0330 FAX: 201-584-0515

MAY 19, 1997  
11:13:06

Client:  
IMPACT ENVIRONMENTAL  
Source:  
Brooklyn

ANALYTICAL DATA SUMMARY REPORT

Client ID	See Notes	See Notes	See Notes	See Notes	See Notes	See Notes
ICM Sample Number	262798	262799	262800	262801	262802	262803
Sampling Date	05/07/97	05/07/97	05/07/97	05/07/97	05/07/97	05/07/97
Units	MG/KG	MG/KG	NA	NA	NA	NA
<hr/>						
GC DRO Parameters						
DRO Petroleum Hydrocarbons	NA	NA	1700	2000	800	900
GC GRO Parameters						
GRO Petroleum Hydrocarbons	NA	NA	620	790	7.0 U	6.6 U

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ICM Laboratories  
Industrial Corrosion Management, Inc.  
1152 Route 10  
Randolph, NJ 07869  
Phone: 201-584-0330 FAX: 201-584-0515

MAY 19, 1997  
11:13:07

Client:  
IMPACT ENVIRONMENTAL  
Source:  
Brooklyn

ANALYTICAL DATA SUMMARY REPORT

Client ID	See Notes	See Notes	See Notes	See Notes	See Notes	See Notes
ICM Sample Number	262798	262799	262800	262801	262802	262803
Sampling Date	05/07/97	05/07/97	05/07/97	05/07/97	05/07/97	05/07/97
Units	MG/KG	MG/KG	NA	NA	NA	NA

INORGANIC PARAMETERS (METALS)

Antimony	1.17	1.20	NA	NA	NA	NA
Arsenic	8.78	6.63	NA	NA	NA	NA
Beryllium	0.293	0.316 U	NA	NA	NA	NA
Cadmium	0.293	0.19 U	NA	NA	NA	NA
Chromium	13.1	9.98	NA	NA	NA	NA
Copper	52.5	99.2	NA	NA	NA	NA
Lead	256	453	NA	NA	NA	NA
Mercury	7.05	3.11	NA	NA	NA	NA
Nickel	13.2	14.9	NA	NA	NA	NA
Selenium	1.17	1.14	NA	NA	NA	NA
Silver	0.293 U	0.316 U	NA	NA	NA	NA
Thallium	0.469 U	0.505 U	NA	NA	NA	NA
Zinc	129	204	NA	NA	NA	NA

ICM Laboratories  
Industrial Corrosion Management, Inc.  
1152 Route 10  
Randolph, NJ 07869  
Phone: 201-584-0330 FAX: 201-584-0515

MAY 19, 1997  
11:13:12

Client:  
IMPACT ENVIRONMENTAL  
Source:  
Brooklyn

ANALYTICAL DATA SUMMARY REPORT--FOOTNOTE PAGE

- U = Indicates a compound was analyzed for but not detected.  
For results marked U, the numerical value is the compound MDL or PQL.
- J = Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit and greater than zero.
- B = Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.
- W = Analytical Spike recovery for furnace AA analysis was not within control limits but was greater than or equal to 40%.
- NA = Not Applicable; P = Positive; N = Negative
- IND = Indeterminable - compound decomposes in water.
- + = Indicates that an MDL was not available for this compound. PQL was reported.
- ++ = Sample boiled at 100 degree C with no flash

NOTES

262798: 97-070-SP-10  
262799: 97-070-SP-11  
262800: 97-070-SP-12  
262801: 97-070-SP-13  
262802: 97-070-SP-14  
262803: 97-070-SP-15  
PAULS

**Analytical Data Reports  
MW-1, 2, 3, 4 and 5**





**Northeast Region**

Meadowbrook Industrial Park  
Milford, NH 03055  
(603) 672-4835  
(603) 673-8105 (FAX)

April 18, 1997

Rich Parish  
Impact Environmental  
46 East Northport Rd.  
Kings Park, NY 11754

---

RE: NEI/GTEL Client ID:	QOT01QOT01
Login Number:	M7040066
Project ID (number):	97-070
Project ID (name):	Impact Environmental 97-070 Kings Park, NY

---

Dear Rich Parish:

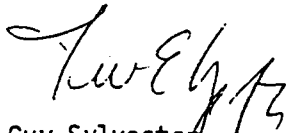
Enclosed please find the analytical results for the samples received by NEI/GTEL Environmental Laboratories, Inc. on 04/05/97.

A formal Quality Assurance/Quality Control (QA/QC) program is maintained by NEI/GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes. This Analytical report shall not be reproduced except in full.

GTEL is certified by the State of New York under Lab ID #10599.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,  
NEI/GTEL Environmental Laboratories, Inc.

  
Guy Sylvester  
Laboratory Director



ANALYTICAL RESULTS  
Volatile Organics

NEI/GTEL Client ID: QOT01QOT01

Login Number: M7040066

Project ID (number): 97-070

Project ID (name): Impact Environmental 97-070 Kings Park, NY

Method: EPA 624

Matrix: Aqueous

NEI/GTEL Sample Number	M7040066-01	M7040066-02	M7040066-03	M7040066-04
Client ID	97-070-MW-1	97-070-MW-2	97-070-MW-3	97-070-MW-4
Date Sampled	04/02/97	04/02/97	04/02/97	04/02/97
Date Analyzed	04/12/97	04/12/97	04/12/97	04/12/97
Dilution Factor	1.00	1.00	1.00	5.00

Analyte	Reporting Limit	Units	Concentration:			
Chloromethane	10.	ug/L	< 10.	< 10.	< 10.	< 50.
Bromomethane	10.	ug/L	< 10.	< 10.	< 10.	< 50.
Vinyl chloride	10.	ug/L	< 10.	< 10.	< 10.	< 50.
Chloroethane	10.	ug/L	< 10.	< 10.	< 10.	< 50.
Methylene chloride	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Trichlorofluoromethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Acrolein	20.	ug/L	< 20.	< 20.	< 20.	< 100
Acrylonitrile	20.	ug/L	< 20.	< 20.	< 20.	< 100
1,1-Dichloroethene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
1,1-Dichloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
1,2-Dichloroethene (total)	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Chloroform	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
1,2-Dichloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
1,1,1-Trichloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Carbon tetrachloride	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Bromodichloromethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
1,2-Dichloropropane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
cis-1,3-Dichloropropene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Trichloroethene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Dibromochloromethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
1,1,2-Trichloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Benzene	5.0	ug/L	< 5.0	< 5.0	< 5.0	480
2-Chloroethyl vinyl ether	10.	ug/L	< 10.	< 10.	< 10.	< 50.
trans-1,3-Dichloropropene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Bromoform	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Tetrachloroethene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
1,1,2,2-Tetrachloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Toluene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Chlorobenzene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Ethylbenzene	5.0	ug/L	< 5.0	< 5.0	< 5.0	390
Xylenes (total)	5.0	ug/L	< 5.0	< 5.0	< 5.0	520
1,3-Dichlorobenzene	10.	ug/L	< 10.	< 10.	< 10.	< 50.
1,4-Dichlorobenzene	10.	ug/L	< 10.	< 10.	< 10.	< 50.
1,2-Dichlorobenzene	10.	ug/L	< 10.	< 10.	< 10.	< 50.

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 624:

GTEL Milford, NH

M7040066

ANALYTICAL RESULTS  
Volatile Organics

NEI/GTEL Client ID: QOT01QOT01

Login Number: M7040066

Project ID (number): 97-070

Project ID (name): Impact Environmental 97-070 Kings Park, NY

Method: EPA 624

Matrix: Aqueous

NEI/GTEL Sample Number	M7040066-01	M7040066-02	M7040066-03	M7040066-04
Client ID	97-070-MW-1	97-070-MW-2	97-070-MW-3	97-070-MW-4
Date Sampled	04/02/97	04/02/97	04/02/97	04/02/97
Date Analyzed	04/12/97	04/12/97	04/12/97	04/12/97
Dilution Factor	1.00	1.00	1.00	5.00

Analyte	Reporting Limit	Units	Concentration:
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Notes: (continued)

"Test Procedures for Analysis of Organic Pollutants", Code of Federal Regulations, 40CFR Part 136, Appendix A. Analyte list may be modified to include additional compounds.

ANALYTICAL RESULTS  
Volatile Organics

NEI/GTEL Client ID: QOT01QOT01

Login Number: M7040066

Project ID (number): 97-070

Project ID (name): Impact Environmental 97-070 Kings Park, NY

Method: EPA 624

Matrix: Aqueous

NEI/GTEL Sample Number	M7040066-05	--	--	--
Client ID	97-070-MW-5	--	--	--
Date Sampled	04/02/97	--	--	--
Date Analyzed	04/12/97	--	--	--
Dilution Factor	20.0	--	--	--

Analyte	Reporting Limit	Units	Concentration:			
Chloromethane	10.	ug/L	< 200	--	--	--
Bromomethane	10.	ug/L	< 200	--	--	--
Vinyl chloride	10.	ug/L	< 200	--	--	--
Chloroethane	10.	ug/L	< 200	--	--	--
Methylene chloride	5.0	ug/L	< 100	--	--	--
Trichlorofluoromethane	5.0	ug/L	< 100	--	--	--
Acrolein	20.	ug/L	< 400	--	--	--
Acrylonitrile	20.	ug/L	< 400	--	--	--
1,1-Dichloroethene	5.0	ug/L	< 100	--	--	--
1,1-Dichloroethane	5.0	ug/L	< 100	--	--	--
1,2-Dichloroethene (total)	5.0	ug/L	< 100	--	--	--
Chloroform	5.0	ug/L	< 100	--	--	--
1,2-Dichloroethane	5.0	ug/L	< 100	--	--	--
1,1,1-Trichloroethane	5.0	ug/L	< 100	--	--	--
Carbon tetrachloride	5.0	ug/L	< 100	--	--	--
Bromodichloromethane	5.0	ug/L	< 100	--	--	--
1,2-Dichloropropane	5.0	ug/L	< 100	--	--	--
cis-1,3-Dichloropropene	5.0	ug/L	< 100	--	--	--
Trichloroethene	5.0	ug/L	< 100	--	--	--
Dibromochloromethane	5.0	ug/L	< 100	--	--	--
1,1,2-Trichloroethane	5.0	ug/L	< 100	--	--	--
Benzene	5.0	ug/L	1500	--	--	--
2-Chloroethyl vinyl ether	10.	ug/L	< 200	--	--	--
trans-1,3-Dichloropropene	5.0	ug/L	< 100	--	--	--
Bromoform	5.0	ug/L	< 100	--	--	--
Tetrachloroethene	5.0	ug/L	< 100	--	--	--
1,1,2,2-Tetrachloroethane	5.0	ug/L	< 100	--	--	--
Toluene	5.0	ug/L	300	--	--	--
Chlorobenzene	5.0	ug/L	< 100	--	--	--
Ethylbenzene	5.0	ug/L	590	--	--	--
Xylenes (total)	5.0	ug/L	980	--	--	--
1,3-Dichlorobenzene	10.	ug/L	< 200	--	--	--
1,4-Dichlorobenzene	10.	ug/L	< 200	--	--	--
1,2-Dichlorobenzene	10.	ug/L	< 200	--	--	--

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 624:

GTEL Milford, NH

M7040066

ANALYTICAL RESULTS  
Volatile Organics

NEI/GTEL Client ID: QOT01QOT01

Login Number: M7040066

Project ID (number): 97-070

Project ID (name): Impact Environmental 97-070 Kings Park, NY

Method: EPA 624

Matrix: Aqueous

NEI/GTEL Sample Number	M7040066-05	--	--	--
Client ID	97-070-MW-5	--	--	--
Date Sampled	04/02/97	--	--	--
Date Analyzed	04/12/97	--	--	--
Dilution Factor	20.0	--	--	--

Analyte	Reporting Limit	Units	Concentration:
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Notes: (continued)

"Test Procedures for Analysis of Organic Pollutants". Code of Federal Regulations. 40CFR Part 136. Appendix A. Analyte list may be modified to include additional compounds.

# Narrative Summary

Login Number: M7040066

Project ID (number): 97-070

Project ID (name): Impact Environmental 97-070 Kings Park, NY

Date of Report: Apr 16, 1997

## Footnotes and Comments

Symbol keys (may appear beside values)

- \* - Indicates the analyte has been qualified in the narrative section of the report.
- d - Indicates the analyte was reported from a dilution other than that indicated on the report page.
- B - Organic Analyses - Indicates the analyte is found in the associated blank as well as in the sample.
- B - Inorganic Analyses - Indicates an estimated value below the EPA Contract Required Detection Limit.
- G - Indicates an estimated surrogate recovery due to dilutions.
- J - Indicates an estimated value below the reporting limit.
- U - Indicates the analyte was analyzed for but not detected.
- NA - Matrix Spike Results - Not Applicable, since the Sample Conc. exceeded four times the Spike Added.
- NA - Matrix Spike Duplicate RPD Results - Not Applicable, since the Sample Conc. exceeded four times the Spike Added.
- NA - Duplicate Sample Results - Not Applicable, since the Sample Conc. was less than five times the Detection Limit.
- NA - Serial Dilution RPD Results - Not Applicable, since the Sample Conc. was less than five times the CLP Contract Required Detection Limit.

## Semi-Volatile Organics

Method: EPA 625

"Test Procedures for Analysis of Organic Pollutants". Code of Federal Regulations, 40CFR Part 136, Appendix

A. Analyte list may be modified to include additional compounds.

1,2-Diphenylhydrazine is quantified as azobenzene.

M7040066-05(NAPHTHALENE): The dilution factor equals 50 ; date analyzed was 4/14/97.

GTEL Client ID: QOT01QOT01

## ANALYTICAL RESULTS

Login Number: M7040066

Project ID (Number): 97-070

Project ID (Name): Impact Environmental 97-070 Kings Park, NY

Date of Report: Apr 16, 1997

EPA 625	GTEL Sample Number	M7040066-01	M7040066-02	M7040066-03	M7040066-04
Semivolatile Organics	Client ID	97-070-MW-1	97-070-MW-2	97-070-MW-3	97-070-MW-4
Matrix: Aqueous	Date Sampled	04/02/97	04/02/97	04/02/97	04/02/97
	Date Prepared	04/08/97	04/08/97	04/08/97	04/08/97
	Date Analyzed	04/09/97	04/09/97	04/09/97	04/09/97
	Adjustment Multiplier	1.00	1.00	1.00	1.00

Analyte	Reporting		Limit	Units				
	Limit	Units						
N-Nitrosodimethylamine	10	ug/L	< 10		< 10		< 10	< 10
Phenol	10	ug/L	< 10		< 10		< 10	< 10
bis(2-Chloroethyl) ether	10	ug/L	< 10		< 10		< 10	< 10
2-Chlorophenol	10	ug/L	< 10		< 10		< 10	< 10
1,3-Dichlorobenzene	10	ug/L	< 10		< 10		< 10	< 10
1,4-Dichlorobenzene	10	ug/L	< 10		< 10		< 10	< 10
1,2-Dichlorobenzene	10	ug/L	< 10		< 10		< 10	< 10
bis(2-Chloroisopropyl) ether	10	ug/L	< 10		< 10		< 10	< 10
N-Nitrosodi-n-propylamine	10	ug/L	< 10		< 10		< 10	< 10
Hexachloroethane	10	ug/L	< 10		< 10		< 10	< 10
Nitrobenzene	10	ug/L	< 10		< 10		< 10	< 10
Isophorone	10	ug/L	< 10		< 10		< 10	< 10
2-Nitrophenol	10	ug/L	< 10		< 10		< 10	< 10
2,4-Dimethylphenol	10	ug/L	< 10		< 10		< 10	< 10
bis(2-Chloroethoxy)methane	10	ug/L	< 10		< 10		< 10	< 10
2,4-Dichlorophenol	10	ug/L	< 10		< 10		< 10	< 10
1,2,4-Trichlorobenzene	10	ug/L	< 10		< 10		< 10	< 10
Naphthalene	10	ug/L	< 10		< 10		< 10	21
Hexachlorobutadiene	10	ug/L	< 10		< 10		< 10	< 10
4-Chloro-3-methylphenol	20	ug/L	< 20		< 20		< 20	< 20
Hexachlorocyclopentadiene	10	ug/L	< 10		< 10		< 10	< 10
2,4,6-Trichlorophenol	10	ug/L	< 10		< 10		< 10	< 10
2-Chloronaphthalene	10	ug/L	< 10		< 10		< 10	< 10
Dimethyl phthalate	10	ug/L	< 10		< 10		< 10	< 10
Acenaphthylene	10	ug/L	< 10		< 10		< 10	< 10
2,6-Dinitrotoluene	10	ug/L	< 10		< 10		< 10	< 10
Acenaphthene	10	ug/L	< 10		< 10		< 10	11
2,4-Dinitrophenol	50	ug/L	< 50		< 50		< 50	< 50
4-Nitrophenol	50	ug/L	< 50		< 50		< 50	< 50
2,4-Dinitrotoluene	10	ug/L	< 10		< 10		< 10	< 10
Diethyl phthalate	10	ug/L	< 10		< 10		< 10	< 10
4-Chlorophenyl phenyl ether	10	ug/L	< 10		< 10		< 10	< 10
Fluorene	10	ug/L	< 10		< 10		< 10	< 10
4,6-Dinitro-2-methylphenol	50	ug/L	< 50		< 50		< 50	< 50
N-Nitrosodiphenylamine	10	ug/L	< 10		< 10		< 10	< 10
1,2-Diphenylhydrazine	50	ug/L	< 50		< 50		< 50	< 50
4-Bromophenyl phenyl ether	10	ug/L	< 10		< 10		< 10	< 10
Hexachlorobenzene	10	ug/L	< 10		< 10		< 10	< 10
Pentachlorophenol	50	ug/L	< 50		< 50		< 50	< 50
Phenanthrene	10	ug/L	< 10		< 10		< 10	< 10
Anthracene	10	ug/L	< 10		< 10		< 10	< 10
Di-n-butyl phthalate	10	ug/L	< 10		< 10		< 10	< 10
Fluoranthene	10	ug/L	< 10		< 10		< 10	< 10
Benzidine	50	ug/L	< 50		< 50		< 50	< 50
Pyrene	10	ug/L	< 10		< 10		< 10	< 10
Butylbenzyl phthalate	10	ug/L	< 10		< 10		< 10	< 10
3,3'-Dichlorobenzidine	20	ug/L	< 20		< 20		< 20	< 20

GTEL: Milford, NH

M7040066 17:38

GTEL Client ID: QOT01QOT01

## ANALYTICAL RESULTS

Login Number: M7040066

Project ID (Number): 97-070

Project ID (Name): Impact Environmental 97-070 Kings Park, NY

Date of Report: Apr 16, 1997

EPA 625	GTEL Sample Number	M7040066-01	M7040066-02	M7040066-03	M7040066-04
Semivolatile Organics	Client ID	97-070-MW-1	97-070-MW-2	97-070-MW-3	97-070-MW-4
Matrix: Aqueous	Date Sampled	04/02/97	04/02/97	04/02/97	04/02/97
	Date Prepared	04/08/97	04/08/97	04/08/97	04/08/97
	Date Analyzed	04/09/97	04/09/97	04/09/97	04/09/97
	Adjustment Multiplier	1.00	1.00	1.00	1.00

Reporting					
Analyte	Limit	Units			
Benzo[a]anthracene	10	ug/L	< 10	< 10	< 10
Chrysene	10	ug/L	< 10	< 10	< 10
bis(2-Ethylhexyl) phthalate	10	ug/L	< 10	< 10	< 10
Di-n-octyl phthalate	10	ug/L	< 10	< 10	< 10
Benzo[b]fluoranthene	10	ug/L	< 10	< 10	< 10
Benzo[k]fluoranthene	10	ug/L	< 10	< 10	< 10
Benzo[a]pyrene	10	ug/L	< 10	< 10	< 10
Indeno[1,2,3-cd]pyrene	10	ug/L	< 10	< 10	< 10
Dibenzo[a,h]anthracene	10	ug/L	< 10	< 10	< 10
Benzo[g,h,i]perylene	10	ug/L	< 10	< 10	< 10

EPA 625	GTEL Sample Number	M7040066-05
Semivolatile Organics	Client ID	97-070-MW-5
Matrix: Aqueous	Date Sampled	04/02/97
	Date Prepared	04/08/97
	Date Analyzed	04/09/97
	Adjustment Multiplier	2.50

Reporting			
Analyte	Limit	Units	
N-Nitrosodimethylamine	10	ug/L	< 25
Phenol	10	ug/L	< 25
bis(2-Chloroethyl) ether	10	ug/L	< 25
2-Chlorophenol	10	ug/L	< 25
1,3-Dichlorobenzene	10	ug/L	< 25
1,4-Dichlorobenzene	10	ug/L	< 25
1,2-Dichlorobenzene	10	ug/L	< 25
bis(2-Chloroisopropyl) ether	10	ug/L	< 25
N-Nitrosodi-n-propylamine	10	ug/L	< 25
Hexachloroethane	10	ug/L	< 25
Nitrobenzene	10	ug/L	< 25
Isophorone	10	ug/L	< 25
2-Nitrophenol	10	ug/L	< 25
2,4-Dimethylphenol	10	ug/L	< 25
bis(2-Chloroethoxy)methane	10	ug/L	< 25
2,4-Dichlorophenol	10	ug/L	< 25
1,2,4-Trichlorobenzene	10	ug/L	< 25
Naphthalene	10	ug/L	4600 d
Hexachlorobutadiene	10	ug/L	< 25
4-Chloro-3-methylphenol	20	ug/L	< 50
Hexachlorocyclopentadiene	10	ug/L	< 25
2,4,6-Trichlorophenol	10	ug/L	< 25
2-Chloronaphthalene	10	ug/L	< 25
Dimethyl phthalate	10	ug/L	< 25
Acenaphthylene	10	ug/L	< 25
2,6-Dinitrotoluene	10	ug/L	< 25

GTEL Milford, NH

M7040066 17:38

GTEL Client ID: QOT01QOT01

## ANALYTICAL RESULTS

Login Number: M7040066

Project ID (Number): 97-070

Project ID (Name): Impact Environmental 97-070 Kings Park, NY

Date of Report: Apr 16, 1997

EPA 625	GTEL Sample Number	M7040066-05
Semivolatile Organics	Client ID	97-070-MW-5
Matrix: Aqueous	Date Sampled	04/02/97
	Date Prepared	04/08/97
	Date Analyzed	04/09/97
	Adjustment Multiplier	2.50

Analyte	Reporting Limit	Units	
Acenaphthene	10	ug/L	190
2,4-Dinitrophenol	50	ug/L	< 130
4-Nitrophenol	50	ug/L	< 130
2,4-Dinitrotoluene	10	ug/L	< 25
Diethyl phthalate	10	ug/L	< 25
4-Chlorophenyl phenyl ether	10	ug/L	< 25
Fluorene	10	ug/L	79
4,6-Dinitro-2-methylphenol	50	ug/L	< 130
N-Nitrosodiphenylamine	10	ug/L	< 25
1,2-Diphenylhydrazine	50	ug/L	< 130
4-Bromophenyl phenyl ether	10	ug/L	< 25
Hexachlorobenzene	10	ug/L	< 25
Pentachlorophenol	50	ug/L	< 130
Phenanthrene	10	ug/L	76
Anthracene	10	ug/L	< 25
Di-n-butyl phthalate	10	ug/L	< 25
Fluoranthene	10	ug/L	< 25
Benzidine	50	ug/L	< 130
Pyrene	10	ug/L	< 25
Butylbenzyl phthalate	10	ug/L	< 25
3,3'-Dichlorobenzidine	20	ug/L	< 50
Benzo[a]anthracene	10	ug/L	< 25
Chrysene	10	ug/L	< 25
bis(2-Ethylhexyl) phthalate	10	ug/L	< 25
Di-n-octyl phthalate	10	ug/L	< 25
Benzo[b]fluoranthene	10	ug/L	< 25
Benzo[k]fluoranthene	10	ug/L	< 25
Benzo[a]pyrene	10	ug/L	< 25
Indeno[1,2,3-cd]pyrene	10	ug/L	< 25
Dibenzo[a,h]anthracene	10	ug/L	< 25
Benzo[g,h,i]perylene	10	ug/L	< 25



## **Analytical Data Reports GRO/DRO Analysis**

## Fuel Fingerprint

Sample 262112 (97-70 Product Sample) was analyzed for gasoline and diesel range organics (GRO and DRO). The sample displayed reportable quantities for GROs and DROs. Both sample chromatographic patterns displayed were similar to that of coal tar. The patterns were not an exact match, although the hydrocarbon range and peak ratio were similar to coal tar.

ICM Laboratories  
Industrial Corrosion Management, Inc.  
1152 Route 10  
Randolph, NJ 07869  
Phone: 201-584-0330 FAX: 201-584-0515

MAY 6, 1997  
15:33:32

Client:  
IMPACT ENVIRONMENTAL  
Source:  
97-070

ANALYTICAL DATA SUMMARY REPORT

Client ID	See Notes
ICM Sample Number	262112
Sampling Date	04/24/97
Units	MG/KG

GC DRO Parameters	
DRO Petroleum Hydrocarbons	38000
GC GRO Parameters	
GRO Petroleum Hydrocarbons	3100

ICM Laboratories  
Industrial Corrosion Management, Inc.  
1152 Route 10  
Randolph, NJ 07869  
Phone: 201-584-0330 FAX: 201-584-0515

MAY 6, 1997  
15:33:34

Client:  
IMPACT ENVIRONMENTAL  
Source:  
97-070

ANALYTICAL DATA SUMMARY REPORT--FOOTNOTE PAGE

- U = Indicates a compound was analyzed for but not detected.  
For results marked U, the numerical value is the compound MDL.
- J = Indicates an estimated value. It is utilized when a reported value meets the identification criteria but the result is less than the specified detection limit and greater than zero.
- B = Indicates that the analyte was found in the blank as well as the sample. It indicates possible/probable blank contamination.
- W = Analytical Spike recovery for furnace AA analysis was not within control limits but was greater than or equal to 40%.
- NA = Not Applicable.
- IND = Indeterminable - compound decomposes in water.
- + = Indicates that an MDL was not available for this compound. PQL was reported.
- ++ = Sample boiled at 100 degree C with no flash
- P = Positive
- N = Negative

NOTES  
262112 - 97-70-Product Sample

**ATTACHMENT C**

**GROUNDWATER INVESTIGATION  
MONITORING REPORT**



**Groundwater Investigation  
Monitoring Report**

**124/136 Second Avenue  
Brooklyn, New York**

**Job No. 97081**

**April 17, 1997**

**NELSON, POPE & VOORHIS, LLC**  
ENVIRONMENTAL • PLANNING • CONSULTING



572 WALT WHITMAN ROAD, MELVILLE, NY 11747-2188 • (516) 427-5665 • FAX (516) 427-5620

Groundwater Investigation  
Monitoring Report

124/136 Second Avenue  
Brooklyn, New York

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Kings Park, New York 11

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ENVIRONMENTAL • PLANNING • CONSULTING

Groundwater Investigation  
Monitoring Report

124/136 Second Avenue  
Brooklyn, New York

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Groundwater Investigation  
Monitoring Report

124/136 Second Avenue  
Brooklyn, New York

1.0 SITE INSPECTION

1.1 REVIEW OF GROUNDWATER RECORDS

1.1.1 Rizzo Associates, Inc.

Rizzo Associates, Inc. performed a Phase II environmental evaluation and submitted a report on the findings, dated January 15, 1991. The need for the Phase II was based on the historical uses of the subject property. The investigation included the installation of several soil borings and five (5) two (2) inch monitoring wells. The report identified floating product in the wells along the west and north side of the vehicle maintenance building. Further, sample analysis of split spoon soil samples and groundwater samples from the wells indicated the presence of elevated concentrations of volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHS), total cyanide and metals. Based on this investigation, it was recommended that the New York State Department of Environmental conservation (NYSDEC) be notified of the environmental quality of the subject property.

On April 8, 1991, a representative of the NYSDEC met with Rizzo Associates to review the data identified in the Phase II report and to prepare guidelines for additional investigative work to determine the environmental quality of the subject property. Accordingly, the additional subsurface investigation was performed and an Additional Subsurface Report dated October 19, 1992, was submitted to the NYSDEC. Said report discussed the installation of six (6) additional two (2) inch monitoring wells, soil borings and a soil gas survey. Analysis of the samples acquired indicated the elevated concentrations of VOCs, acid, base/Neutral extractable (ABNs), metals (chromium) and cyanide.

1.1.2 Unico Service Corp.

A review of documents associated with NYSDEC spill number 92-14380 identified the removal of seven USTs (4- 5000 gal. and 3-1000 gal.) from the subject property during the period of March 29, 1993 to April 13, 1993 by Unico Service Corp. Additionally, the review of the records showed a Subsurface Investigation performed by Unico Environmental Inc., dated July 10, 1993, in response to NYSDEC spill number 92-14380. Said investigation included the installation of five monitoring wells with split spoon samples acquired from each monitoring well location on the subject property. Data from the investigation identified elevated levels of volatile organic compounds and semi-volatile organic compounds in monitoring wells MW-2, MW-4 and MW-5.



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## 2.0 MONITORING WELL INSPECTION

### 2.1 WELL INSPECTION

Each of the groundwater monitoring wells were inspected for accessibility and any obvious signs of gross contamination. **Table 1** presents initial field observations made on site reconnaissance on March 27, 1997.

**TABLE 1**  
**WELL INSPECTION FINDINGS**

Well No.	MW -1	MW -2	MW -3	MW -4	MW -5	RIZ- 1	RIZ -2	RIZ -3	RIZ -4	RIZ -5	RIZ -6	RIZ -7	RIZ -8	RIZ -9	RIZ -10	RIZ -11
Accessibility	good	good	good	good	good	poor	IA	IA	IA	D	D	IA	IA	D	IA	IA
Condition	good	good	good	good	good	good	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Comment	gas	gas	gas	gas	gas*	gas*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes: IA - inaccessible                      D - Destroyed  
 NA - not available                      \* black residue at bottom  
 gas - indicates gasoline odor detected in well casing during sampling

#### 2.1.1 Summary of Well Status

The five (5) four inch wells installed by Unico Service Corp. are all accessible and were tested to be functioning properly for use as groundwater quality monitoring wells. All of these wells were impacted by volatile and semi-volatile organic compounds to varying degrees. Of the eleven monitoring wells / piezometers installed by Rizzo Associates, Inc., only eight of the wells (RIZ-1, RIZ-2, RIZ-3, RIZ-4, RIZ-7, RIZ-8, RIZ-10, and RIZ-11) were located on the subject property. RIZ-2, RIZ-3, RIZ-4, RIZ-7, RIZ-8, RIZ-10, and RIZ-11 wells were inaccessible at the time of the inspection. Further, several of the wells (RIZ-1, RIZ-2, RIZ-7, RIZ-8, and RIZ-11) are obsolete due to the proximity of the Unico Services Corp. wells which are of superior construction.

### 2.2 DEPTH TO PRODUCT/WATER

Each of the groundwater monitoring wells were surveyed utilizing a Flexi-Dip ullage-interface, manufactured by Marine Moisture Co., Inc., Inwood, New York. The survey was performed to determine the exact depth to product and/or groundwater (interface). **Table 2** presents the results of this survey, where DTW means depth to water; DTP means depth to product; PT means product thickness.

TABLE 2  
WELL SURVEY

Well No.	Well Depth (ft.)	3/27/97 DTW-DTP=PT (ft.)	4/5/97 DTW-DTP=PT (ft.)
MW-1	18.1	6.99 [0]	6.88 [0]
MW-2	18.7	5.55 [0]	5.50 [0]
MW-3	17.8	5.29 [0]	5.21 [0]
MW-4	18.8	5.76 [0]	5.70 [0]
MW-5	18.0	3.18 [0]	3.12 [0]
RIZ-1	17.8	2.92 [0]	2.82 [0]
RIZ-2	NA	NA	NA
RIZ-3	NA	NA	NA
RIZ-4	NA	NA	NA
RIZ-5	NA	NA	NA
RIZ-6	NA	NA	NA
RIZ-7	NA	NA	NA
RIZ-8	NA	NA	NA
RIZ-9	NA	NA	NA
RIZ-10	NA	NA	NA
RIZ-11	NA	NA	NA

Notes: NA - indicates not available

### 3.0 SAMPLE ACQUISITION AND FIELD ANALYSIS

#### 3.1 WELL DEVELOPMENT AND SAMPLING

Each of the groundwater monitoring wells was developed and sampled in accordance with U.S. EPA protocol by a certified technician. Approximately three well volumes of water were bailed from each of the wells for development. Sampling was immediately performed utilizing a clean dedicated Voss disposable bailer for each well to prevent cross-contamination. Samples were preserved in both a 40-ml glass vial and a 1-liter glass bottle. Samples were preserved at 4°C in a cooler and transported under active chain-of-custody to a NYS-DOH certified commercial laboratory for analysis. Table 3 presents sample identification codes for each groundwater monitoring well.

**TABLE 3**  
**WELL SAMPLE IDENTIFICATION**

Well No.	Sample Code	Well No.	Sample Code	Well No.	Sample Code
MW-1	97-070-MW-1	RIZ-1	NA	RIZ-6	NA
MW-2	97-070-MW-2	RIZ-2	NA	RIZ-7	NA
MW-3	97-070-MW-3	RIZ-3	NA	RIZ-8	NA
MW-4	97-070-MW-4	RIZ-4	NA	RIZ-9	NA
MW-5	97-070-MW-5	RIZ-5	NA	RIZ-10	NA
----	----	----	----	RIZ-11	NA

Notes: NA - indicates not available  
All samples collected on April 2, 1997

#### 3.2 RCRA Characteristics

The samples acquired from each well was analyzed in the field for temperature, pH, conductivity utilizing a Beta Technologies Incorporated digital conductivity/temperature/pH tester. Additionally, the turbidity of each sample was gauged by visual inspection using a one (1) to five (5) scale and the percentage of dissolved oxygen in each groundwater sample was acquired utilizing an ATI Orion dissolved oxygen meter. Table 4 presents RCRA characteristics as recorded in the field during sample acquisition:

TABLE 4  
WELL RCRA CHARACTERISTICS

Well No.	Temp. (F)	Conductivity (us/cm)	pH (units)	DO (%)	Turbidity (1-5)
MW-1	50.8	53.8	6.8	4.3	2
MW-2	51.3	660	7.25	3.6	3
MW-3	54.6	2,860	6.91	2.2	2
MW-4	51.5	5,350	6.95	2.2	2
MW-5	51.9	881	7.22	2.6	2
RIZ-1	NA	NA	NA	NA	NA
RIZ-2	NA	NA	NA	NA	NA
RIZ-3	NA	NA	NA	NA	NA
RIZ-4	NA	NA	NA	NA	NA
RIZ-5	NA	NA	NA	NA	NA
RIZ-6	NA	NA	NA	NA	NA
RIZ-7	NA	NA	NA	NA	NA
RIZ-8	NA	NA	NA	NA	NA
RIZ-9	NA	NA	NA	NA	NA
RIZ-10	NA	NA	NA	NA	NA
RIZ-11	NA	NA	NA	NA	NA

Notes: NA - indicates not available  
F - indicates Fahrenheit  
DO - indicates dissolved oxygen

#### 4.0 SITE SURVEY

##### 4.1 GROUNDWATER ELEVATIONS

The five wells installed by Unico Service Corp. were surveyed for well head (casing) elevation. The well head elevations are relative to an arbitrary benchmark of 100.00 feet above sea level and are presented in Table 5 below.

TABLE 5  
GROUNDWATER ELEVATIONS

Well Number.	Well Depth (ft.)	Well Head Elevation (ft.)	3/27/97 Groundwater Elevation (ft.)	4/5/97 Groundwater Elevation (ft.)
MW-1	18.1	99.00	92.01	92.12
MW-2	18.7	98.34	92.79	92.84
MW-3	17.8	98.31	93.02	93.10
MW-4	18.8	98.50	92.74	92.80
MW-5	18.0	95.94	92.76	92.37
RIZ-1	NA	NA	NA	NA
RIZ-2	NA	NA	NA	NA
RIZ-3	NA	NA	NA	NA
RIZ-4	NA	NA	NA	NA
RIZ-5	NA	NA	NA	NA
RIZ-6	NA	NA	NA	NA
RIZ-7	NA	NA	NA	NA
RIZ-8	NA	NA	NA	NA
RIZ-9	NA	NA	NA	NA
RIZ-10	NA	NA	NA	NA
RIZ-11	NA	NA	NA	NA

Notes: NA - indicates not accessible

## 4.2 Groundwater Flow and Gradient

A water-table elevation map was constructed from monitoring well observations made 3/27/97 and 4/5/97, and is presented in **Appendix A**, Hydraulic Gradient Maps, Brooklyn, New York. Based on the map, the gradient varies from a southern down gradient direction to a southeastern down gradient direction. This flow gradient is opposite to the anticipated flow direction. However, the well elevations acquired from the Unico Environmental Inc., Subsurface Investigation report and used in groundwater flow direction calculations may be, at this date, inaccurate. During inspection of these wells, it was noted that the well covers had been disturbed due to suspected frost upheaval. Considering the negligible calculated gradient, any disturbances in the well elevations may skew groundwater flow direction calculations. Accordingly, a hydraulic gradient map was constructed utilizing the data from the Unico Environmental Inc. Subsurface Investigation report which indicates the flow direction towards the Gowanus Canal. It is recommended that the well elevations be surveyed to confirm the current calculations.

In addition to the data collected it can be assumed that the gradient and direction has some degree of tidal influence from the Gowanus Canal and Gowanus Bay located 500 feet northwest and 1500 feet southwest of the site, respectively. The suspected tidal influence can be confirmed by a series of eight hour well monitoring programs.

## 5.0 QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES (QA/QC)

The following sampling QA/QC protocol is in accordance with the United States Environmental Protection (USEPA) Agency's accepted sampling procedures for hazardous waste streams [Municipal Research Laboratory, 1980, Sampling and Analysis Procedures for Hazardous Material Waste Streams, Office of Emergency and Remedial Response, Cincinnati, Ohio. EPA-600/280-018] and American Society of Testing and Material's (ASTM) Sampling Procedures.

### 5.1 SAMPLING PERSONNEL

All samples were secured by or under the auspices of a USEPA Office of Emergency and Remedial Response, Certified Sampler for Hazardous Materials. Sample staff (samplers) possessed a minimum of a B.A. Degree in the Earth and Space Sciences or a B.S. Degree in Engineering. Samplers had a minimum of one (1) year experience in environmental/geological field work. Additionally, all samplers had received mandatory forty-hour Occupational Safety and Health Administration (OSHA) training on working with potentially hazardous materials and appropriate Hazard Communication Program and "Right-To-Know" training.

### 5.2 SAMPLING EQUIPMENT

Separate QA/QC measures were implemented for each of the instruments used in the performance of this investigation. For this investigation, an ullage-interface, digital conductivity/temperature/pH tester, and dissolved oxygen meter were used. Calibration of the equipment was conducted prior to sampling using manufacturers specifications. Decontamination measures were observed between samples.

### 5.3 SAMPLE DOCUMENTATION

A sample represents physical evidence. An essential part of liability reduction is the proper control of gathered evidence. To establish proper control, the following sample identification and chain-of-custody procedures were followed. Sample identification was conducted by use of a sample tag, log book and/or chain-of-custody form. Said documentation provided the following information: 1) the project code; 2) the sample laboratory number; 3) the sample preservation (if applicable); 4) instrument used for source sample grabs; 5) the composite medium used for source sample grabs; 6) the date the sample was secured from the source media; 7) the time the sample was secured from the source media; and 8) the person who secured the sample from the source media.



## 6.0 NYSDEC TANK/SPILL DOCUMENTATION

NYSDEC records indicate that two spills have been recorded for the subject property, identified as spill numbers 92-01414 and 92-14380. The first spill is listed in the orphan summary of the NYSDEC database, with the site located at 138 2nd Street. The second spill is not listed in the EDR database, but is a known NYSDEC spill incident involving removal of gasoline tanks from the VMF.

Contact with the U.S. Post Office resulted in some limited records regarding NYSDEC tank and spill records. **Appendix B** contains several memos from the State concerning the site.

A letter dated March 7, 1997 from Kerri-Ann O'Dowd, NYSDEC Spills Management Division to Mario J. Spina of the U.S. Postal Service indicates that the NYSDEC recommended abandonment of the heating oil tanks on the subject site at that time. The procedure for abandonment was outlined. In addition, the letter indicates NYSDEC was awaiting the closure report for the motor fuel tanks, as well as an update of the petroleum bulk storage records.

A print out of the NYSDEC PBS file dated June 10, 1994 found 3-20,000 gallon tanks remaining at the 136 Second Avenue address. Four (4) 10,000 gallon tanks were identified as removed from the site in May, 1993.

NYSDEC reviewed the Unico Service Corp. reports summarized in Section 1.1.2 of this document, and responded to the USPO in a letter dated June 20, 1994. The State acknowledged contravention of the water quality standards and required additional work to define the extent of groundwater contamination. To date, there is no evidence that this work has been completed. The letter indicates the need to install six (6) wells on site. Unsaturated soils were to be screened with a photoionization detector and soils and groundwater were to be sampled for USEPA test method 8021/8270. The State provided a map of well locations and requested that the investigation report include a proposal for remediation of contamination. **Appendix B** contains relevant documentation and maps.

## 7.0 SUMMARY AND CONCLUSIONS

This Groundwater Investigation Report is intended to address the following tasks:

- Perform inspection of subject site to determine current site conditions. Document status and condition of remaining tanks (if present); determine presence, condition and accessibility of monitoring wells; and record relevant findings with regard to historical site use.
- Survey all wells for odor and presence of floating product, temperature, pH, conductivity, and turbidity utilizing a Flexi-Dip ullage-interface and a Hydac Tester.
- Survey 3-5 wells for depth to water and survey wells for vertical elevation to generate a groundwater contour map with inferred direction of flow and gradient.
- Review spill documentation for completeness and determine regulatory and environmental status of tanks based on available information.
- Document findings in Site Survey and Groundwater Investigation Report.

Tasks have been completed and the following findings are relevant:

- The condition of wells on site has been determined and five (5) wells (Unico wells) appear to be serviceable. Remaining wells (RIZ wells) are not locatable or not useable.
- There was no floating product detected in any accessible wells. Gasoline odor was detected in the six (6) accessible wells.
- Well elevations appear to have changed due to frost heaving, thereby requiring updated well survey work in order to accurately predict groundwater gradients.
- There is an above ground storage tank in the southwest corner of the site that is within a containment structure.
- There are 3-20,000 gallon steel tanks in the western basement of the Detached Mail Unit building, that store #4 or #6 fuel oil to fuel the boiler. These tanks are partially in groundwater and are currently not in service. These tanks should be removed or abandoned in accordance with NYSDEC requirements and the PBS records should be updated.
- There are four (4) 10,000 gallon underground fuel tanks in the DMU building that are reportedly located beneath the floor of the building. These tanks should be removed or abandoned in accordance with NYSDEC requirements and the PBS records should be updated.
- There is an active spill file concerning contaminated soil encountered at the time of removal of former gas tanks associated with the VMF building. Further monitoring and remedial activities are required by the NYSDEC.

The site will be the subject of further investigation as a result of a Sampling and Analysis Program designed to address NYSDEC spill file issues and to further characterize the environmental quality of soils and groundwater on site.



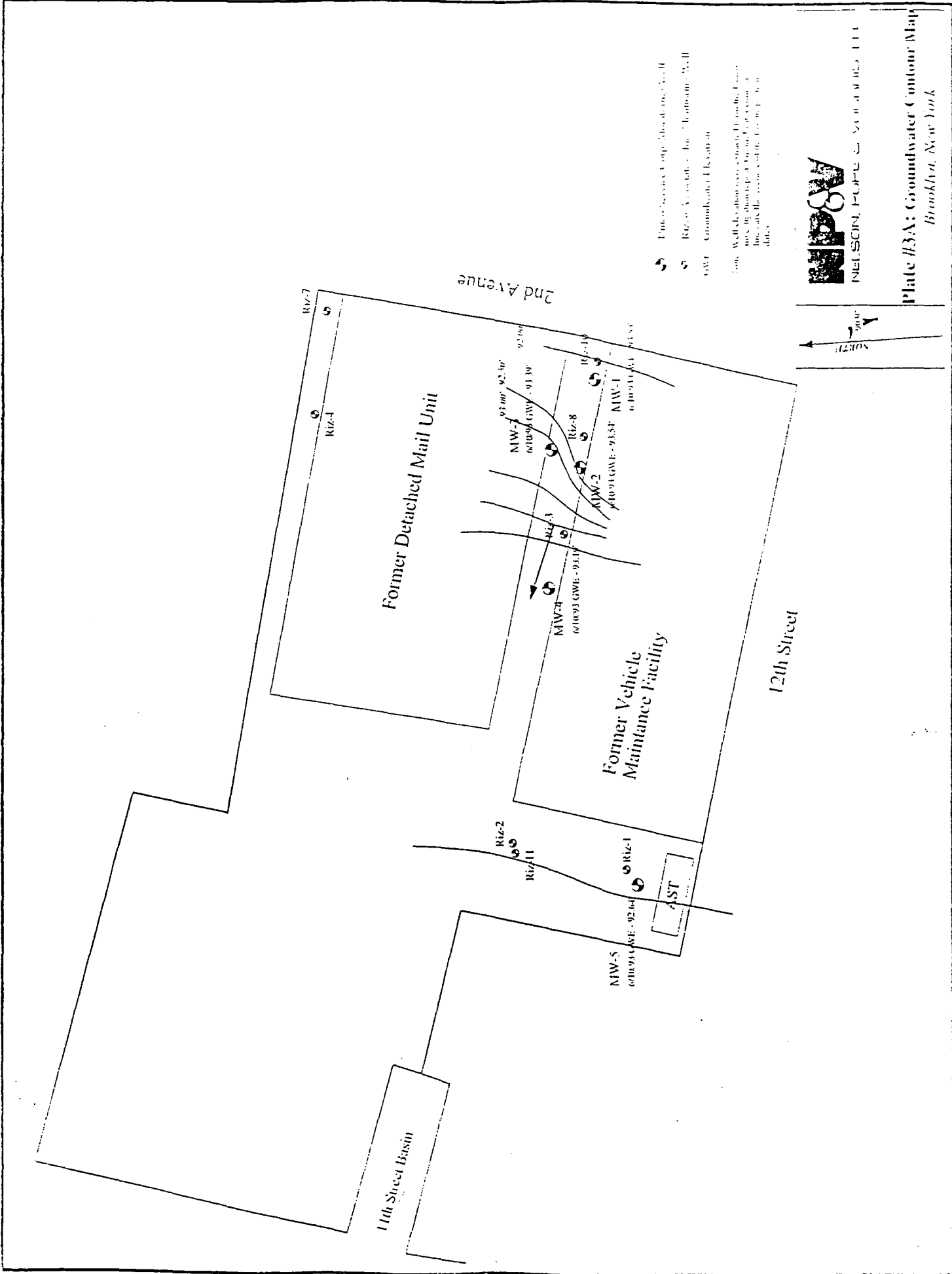
## APPENDIX



APPENDIX A

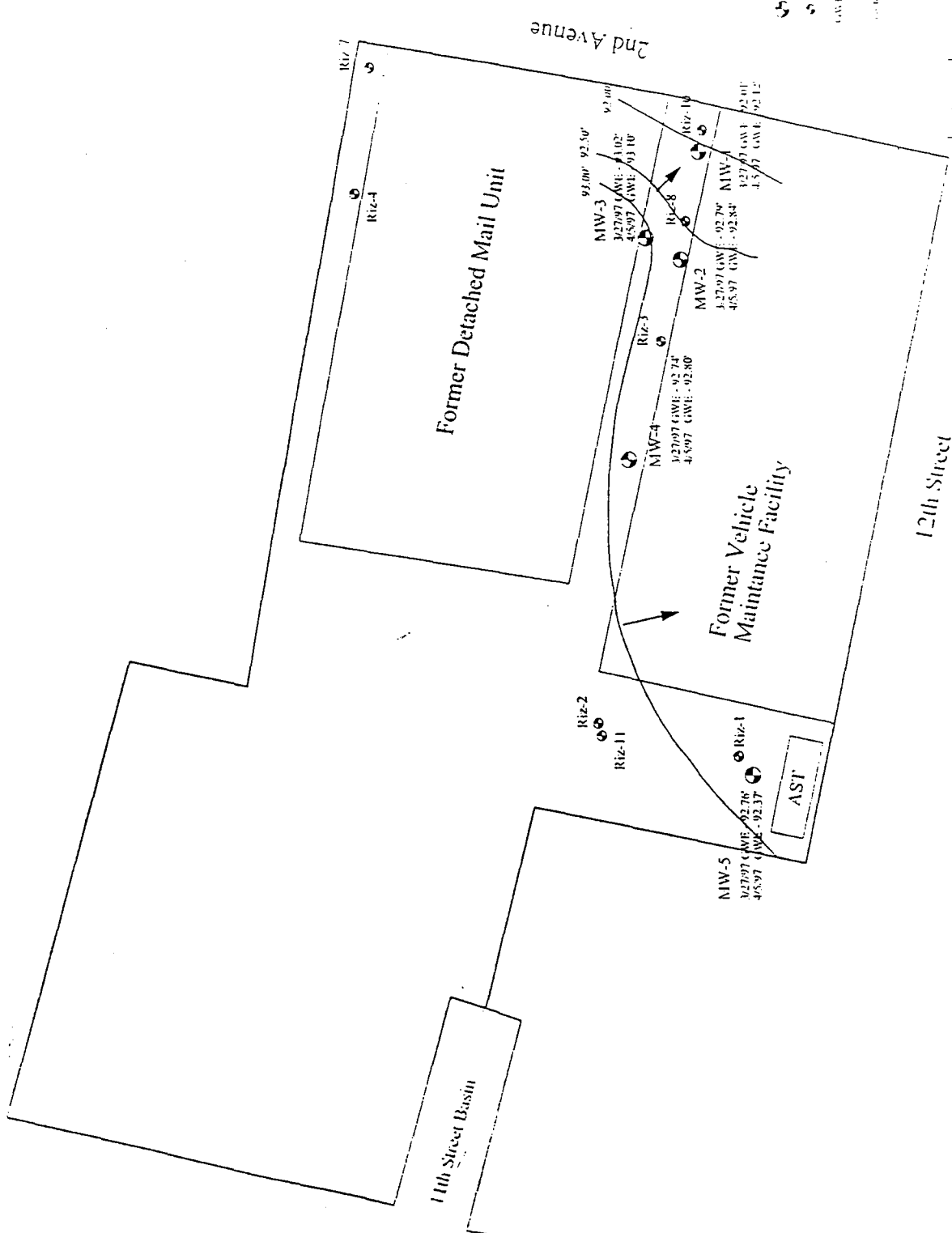
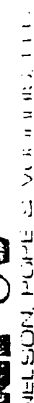
WELL LOCATIONS AND  
GROUNDWATER CONTOUR MAPS





NELSON AEE CONSULTING  
1100 11th Street, Suite 200  
Brooklyn, NY 11211

Plate #3A: Groundwater Contour Map  
Brooklyn, New York



## APPENDIX B

### NYSDEC TANK/SPILL LETTERS



New York State Department of Environmental Conservation



Thomas C. Jorling  
Commissioner

March 7, 1994

Mario J. Spina Jr.  
Facilities Specialist  
Administrative Support  
UNITED STATES POSTAL SERVICE  
TRIBORO DISTRICT  
142-02 20th Avenue  
Flushing, New York 11351-9991

Re: U.S. Post Office  
11th St. & 2nd Ave.  
Brooklyn  
Spill #: 9214380  
PBS #: 2-452440

Dear Mr. Spina,

Upon completion of two site visits to the above mentioned facility, New York State Department of Environmental Conservation recommends the closing out of the heating oil tanks as per 6 NYCRR 613.9 (b).

This entails the removal of liquid and sludge from the tank and connecting lines. Any waste products removed must be disposed of in accordance with all applicable state and federal requirements. The tanks must be rendered free of petroleum vapors. Provisions must be made for natural breathing of the tank to ensure that the tank remains vapor free. All connecting lines must be disconnected and removed or securely capped or plugged. Manways must be securely fastened in place. Aboveground tanks must be stenciled with the date of permanent closure. Also, aboveground tanks must be protected from floatation in accordance with good engineering practice.

NYSDEC still is awaiting the closure report for the motor fuel tanks at this facility. Please make sure all PBS records are updated and accurate for this facility.

If you have any questions concerning this matter, please call my office at (718) 482-4933 Ext. 7130.

Sincerely,

Kerri-Ann O'Dowd  
Environmental Engineer I  
Spills Management Division  
Region 2



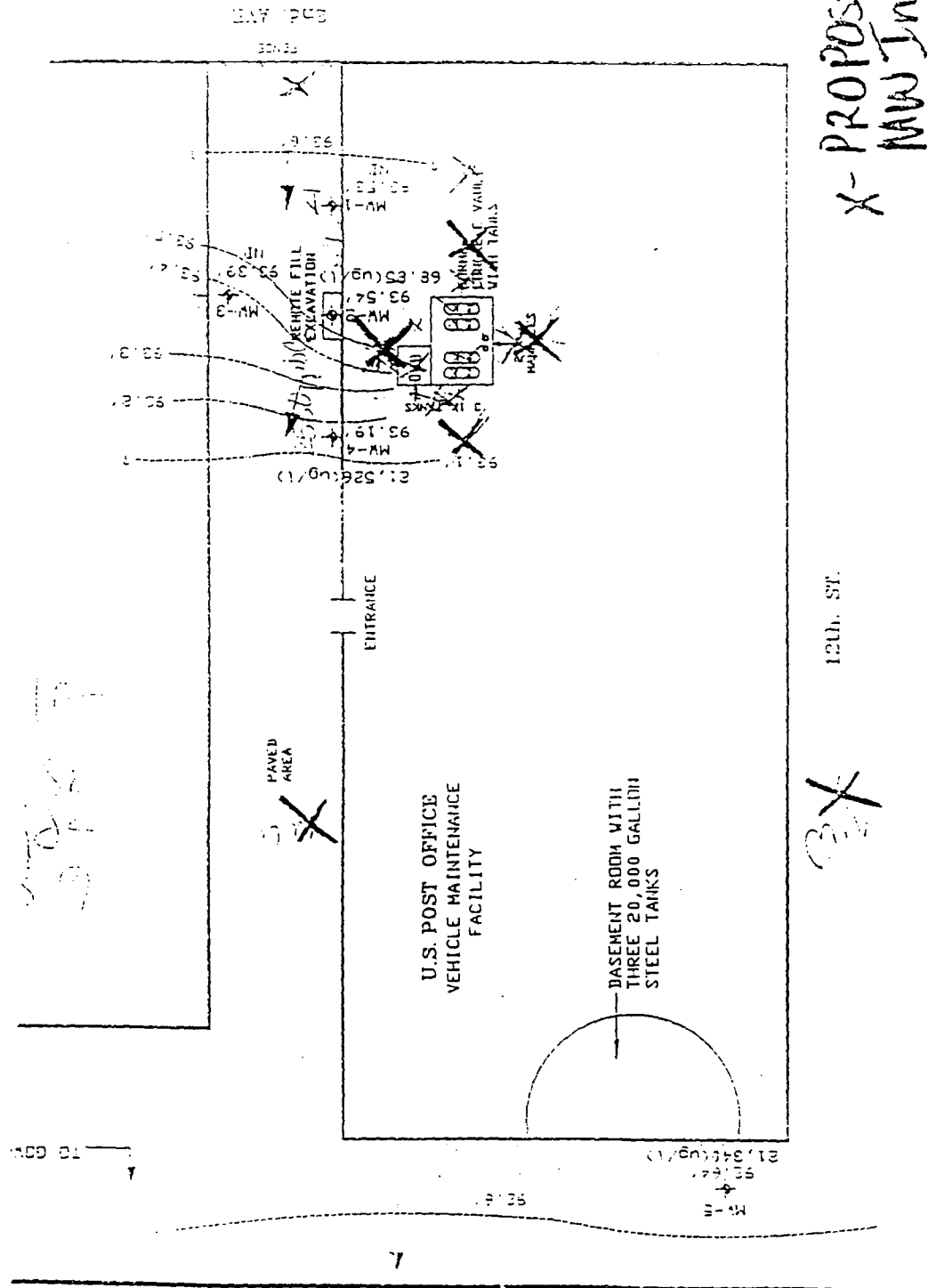
If you have any questions concerning this matter, please call my office at (716) 433-4933 Ext. 7133.

Sincerely,

*Kerri-Ann O'Dowd*  
Kerri-Ann O'Dowd  
Environmental Engineer I  
Spills Management Division  
Region 2

cc: Austin, NYSDEC  
Applebaum, Unico

X-PROPOSED  
RAW Installation



NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
Petroleum Bulk Storage Program  
Facility Information Report

Printed : 06/10/94

PUS # : 2-452440

Site : US POSTAL SERVICE- VMF

136 SECOND AVE

136 2ND AVE

BROOKLYN, NY 11215

County : KINGS

Town : NEW YORK CITY

Latitude : N Longitude : W

SPDES# : CBS# :

Site Type : Info Not Given.

Operator : US POSTAL SERVICE (718) 834-5556

Emergency : W. CAMPBELL- FLEET OPERATIONS (718) 834-5556

Site status : Active

Total Active Tanks : 3

Active Capacity : 60,000 gals.

Reg Expires : 08/23/93

Last Inspection : / /

Cert Printed : 08/23/88

Site Errors : Minor Data Missing

Owner Error : Minor Data Missing

Tank Errors : Minor Data Missing

Owner : US POSTAL SERVICE

271 CADMAN PLAZA EAST

BROOKLYN, NY 11201

Phone : (718) 834-3610

Owner Type : Federal Government

Mail : US POSTAL SERVICE

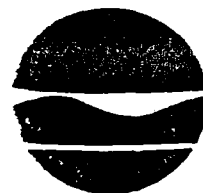
271 CADMAN PLAZA EAST

BROOKLYN, NY 11201

Att : (718) 834-3610

TankNo	TankLoc	Stat	DateIn	Capac (g)	Product	TankType	TankInt	TankExt	PipeLoc	PipeType	PipeInt	PipeExt	SecCont	Leak	Overfil	Disp	LastTest	NextTest	TStat
005	5	1	00/00	20,000	3	1				1			0	0		2			2
006	5	1	00/00	20,000	3	1				1			0	0		2			2
007	5	1	00/00	20,000	3	1				1			0	0		2			2
001	5	3	00/00	5,000	6	1				1			1	0	4	2			REMOVED : 05/93
002	5	3	00/00	5,000	2	1				1			1	0	4	2			REMOVED : 05/93
003	5	3	00/00	5,000	6	1				1			1	0	4	2			REMOVED : 05/93
004	5	3	00/00	5,000	6	1				1			1	0	4	2			REMOVED : 05/93

New York State Department of Environmental Conservation  
47-40 21st Street, Long Island City, New York 11101



Thomas C. Jorling  
Commissioner

June 20, 1994

Mario J. Spina Jr.  
Facilities Specialist  
Administrative Support  
UNITED STATES POSTAL SERVICE  
TRIBORO DISTRICT  
142-02 20th Avenue  
Flushing, New York 11351-9991

Re: U.S. Post Office  
11th St. & 2nd Ave.  
Brooklyn

Spill #: 9214380  
PBS #: 2-452440

Dear Mr. Spina,

New York State Department of Environmental Conservation has reviewed the submitted Tank-Field Excavation Assessment and the Subsurface Investigation Report for the above mentioned facility.

After review of these documents, it was shown that a contravention of groundwater quality standards exists. Therefore, a delineation of the extent of groundwater contamination is required.

NYSDEC wants the installation of six (6) test borings/monitoring wells as shown on the attached map, as access permits. Split spoon sampling with PID screening. If the PID does not indicate that any of the samples are contaminated, then the final sample from the soil/water interface should be analyzed for EPA Method 8021 & 8270. Following well development and well survey, the water samples should be analyzed for EPA Method 8021 & 8270. Upon completion of this work, NYSDEC is expecting the investigation report to include a proposal for remediation of the contamination.

If you have any questions concerning this matter, please call my office at (718) 432-4933 Ext. 7130.

Sincerely,

A handwritten signature in cursive script, appearing to read "Kerri-Ann O'Dowd".

Kerri-Ann O'Dowd  
Environmental Engineer I  
Spills Management Division  
Region 2

cc: Austin, NYSDEC  
Applebaum, Unico

